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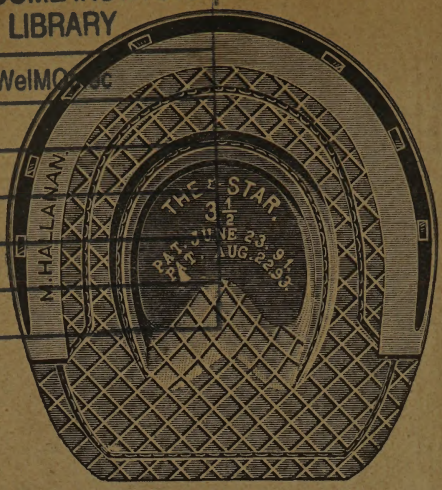

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THE
VETERINARY MAGAZINE.

VOL. III. JUNE, 1896. No. 6.

THE SOURCE OF VACCINE VIRUS.*

BY H. M. ALEXANDER, M. D.

Had the "Immortal Jenner" cast aside his timidity at the early age of twenty, when first his attention was drawn to the protective influence of cowpox by the peasant maid of Sadbury, he would have saved more suffering and more lives in the twenty-seven years that elapsed until his inoculation of James Phipps, than ever have been or perhaps ever will be the good fortune of any one man to save. But of Jenner's tests, trials and triumphs in introducing vaccination it is not our province here to speak. We propose to inquire into the *source* of Jenner's supplies. What of this disease, coxpox? and, where is it today? Jenner is credited with saying, that the disease known as grease on the heels of horses was the the source of smallpox (Baron's life of Jenner, vol. i). He is also credited with having said that "cowpox is the grease of horses conveyed to the udder of the cow by the hands of men who, after washing the greasy heels of horses, milked the cows." He vaccinated his own child with swinepox and found it effectual. We would ask: was Jenner an enthusiast, blind to results, believing every experiment a success? or are not many of the statements ascribed to him, the utterance of other experiments, or born of the imaginative mind of the writer? Does any one believe to-day that horse-grease is the source of cowpox? Has it been fully demonstrated that children inoculated with horse-grease are protected from smallpox, or have

* Read before the Lancaster (Pa.) City and County Medical Society.

experiments with horse-grease communicated to the cow, thence to the child, been extended enough to convince you that it is one and the same, or as certainly protective? The maids of Jenner's English home are spoken of as the milkers; were they engaged in washing the horses' heels? We have horse-grease in abundance to-day, and in many sections men wash the sores and also do the milking; but cowpox is far from being as readily found as in the days of Jenner. With a view to satisfy myself I instituted a few experiments, procured virus from the heels of horses affected with the grease, and tested it on three heifers. I had two failures, while one had a light pustular affection not altogether unlike cowpox, but it was incapable of producing the vaccine disease. All of these heifers took cowpox for me afterward. True, I might have met with better results had I repeated my experiments; as it is they have tended to lessen my belief in the now generally accepted theory of horse-grease cowpox. Is cowpox a frequent visitor of the dairy? We learn of its existence in 1769, again in 1775. Then we are told, Jenner was unable to test its protective powers for many years, owing to its scarcity. It appears again in 1788, 1796 and 1798. From that time this enthetic disease of the cow does not appear as frequently as in Jenner's day; but it does exist today, and is more common than is generally supposed.

Some would have us believe cowpox to be simply smallpox in the cow. Before properly investigating the subject, I believed this theory, and held that smallpox was so common in England in the days of Jenner that the milkmaids, convalescent from an attack, inoculated the cows while in the act of milking. This appeared at first sight to explain the presence and absence of the disease from the dairies. Again, the apparent absence of the disease today is explained by the fact that smallpox seldom enters the homes of our agricultural classes, but is confined largely to our cities and towns, whose population do but little milking. This reasoning would appear much more plausible were it not that history tells us of smallpox scourges too dreadful to relate, having visited England during the very years Jenner was unable to pursue his study of the subject owing to the disappearance of cowpox; and the years of 1775 and 1796, when he was able to procure his experimental virus in abundance, were not noted years for smallpox

epidemics. Again, heifers inoculated with smallpox virus have been unable to communicate vaccinia to man, but have instead given him true variola.

Passing over the period of the introduction of vaccination into America by Dr. Benj. Waterhouse, as not strictly belonging to its source, I will draw your attention to the spontaneous cases of cowpox of later years, which furnish the *source* of our present strains of vaccine virus, and of whose histories we have more knowledge.

In the year 1866 a case of spontaneous cowpox was discovered in France. The most complete history of this case I found in the report of the *Medical News* commission to examine vaccine farms, made by Dr. W. M. Welch, physician in charge of the Municipal Hospital, of Philadelphia. He says: "The history of Beaugency virus dates back to March 28, 1866. On April the 26th, it was reported to the Academy of Medicine of France, that a case of casual or spontaneous cowpox had been observed at Beaugency, a town in France. Professor Depaul, 'Director De la Vaccine,' promptly repaired to that town, and saw as reported a young milch cow thirty months old, in which the disease had appeared. The milker of this cow had noticed March 28, that the animal was less gentle than usual; and presently a French midwife observed vesicles on the udder, which bore a striking resemblance to vaccine vesicles, with which she was very familiar. This midwife, a veterinary surgeon, and four physicians of the town, closely inspected the animal, and found seven or eight vesicles on the udder at the base of the teats. In the same stable was another cow, but she bore no evidences of the disease. A horse in an adjoining stable was examined by the veterinary surgeon, but failed to present any symptoms of grease or any other disease." With a view to testing the genuineness of the disease, another cow and two children were inoculated from this virus; these trials were successful, the vesicles perfectly characteristic. M. Bechemeier and several other physicians then visited Beaugency, obtained some virus from this second cow, carried it to Orleans and vaccinated a calf, but out of six insertions only succeeded in obtaining one true vesicle. Had that also failed we venture to assert that Beaugency vaccine virus would then and there have received its death blow, and the many millions of human beings who have since that time been vaccinated from this pure

source would have been compelled to resort to the old deteriorated strains, or to humanized lymph with all its ills. And all this loss because it had been entrusted to hands not sufficiently expert in its bovine application; for I cannot but believe that all who have had any reasonable amount of experience in bovine propagation of vaccine virus, will agree with the assertion that the lymph would have done fully as well in the remaining five insertions as it did in the one, had it been properly applied. Another calf and several children were successfully inoculated from this one vesicle. From this calf Professor Depaul began his propagation of bovine virus.

From Depaul's production the late Dr. Henry A. Martin procured the supply with which he in 1870 began the propagation of bovine virus in America. Dr. Martin claims his to to have been the 260″ heifer of Depaul's series. To Dr. Martin we concede the honor of introducing animal vaccination into America, and in his death the cause has lost an ever-willing and reliable advocate.

Dr. Martin, fully realizing that by a long series of heifer-to-heifer propagation the virus must deteriorate, and seeing the great advantage that would accrue from a fresh source, endeavored to find a case of spontaneous cowpox in America. We are told by Dr. Welch he "offered a pecuniary reward." After several disappointments he finally succeeded in February, 1881, in finding a genuine case of spontaneous cowpox at Cohassett, Mass. This he tested, and has since continued its propagation.

Ever since I became interested in the subject of vaccine virus in 1876, I have been constantly watching and inquiring for a case of spontaneous cowpox. On the twenty-eighth day of January last, I was rewarded by having reported to me a genuine case on the farm of Henry Fletcher, about one mile from Marietta, Pa. I have for many years held the belief that cowpox is not as rare as many physicians suppose. It may appear strange that the only cases ever discovered in America should have been found by men engaged in the propagation of bovine vaccine virus, and so near their homes. This is easily explained by the fact that physicians not acquainted with the disease in cattle, and comparatively few have ever been inside a vaccine establishment, or examined the pock closely as it appears on the cow, could not readily diagnose a case should their attention be called to one, and the owner of a diseased

heifer is not at all likely to notify any one of a light pustular disease on his cattle. It will be remembered that Dr. Martin's Cohassett case was reported to him only after he had offered a "pecuniary reward;" while mine was reported from the fact of my being engaged in the business, and after drawing the attention of the farmers of my district to the fact that I was desirous of finding a spontaneous case. This spontaneous case occurred in a fine Jersey heifer of about eighteen months. In company with Dr. J. M. Shartle, I made a careful examination, knowing its great value in affording us a fresh source from which to propagate without risking the old strains, deteriorated or contaminated by a long series of heifer-to-heifer propagations. Remembering that Dr. Welch when a member of the commission, made this statement, "When an original stock of virus of the highest excellence is discovered, it should be perpetuated with almost religious care," and having unbounded respect for the opinions of Dr. Welch on the subject of vaccination, I promptly notified him, together with L. E. Sayre, Ph. D., Professor of Pharmacy in the University of Kansas, late of the *Druggists' Journal*, who from his vast store of chemical knowledge, rendered me much efficient service in former undertakings. Dr. F. E. Steward, of the *Therapeutic Gazette*, well known to you all as the only journal devoted exclusively to therapeutics in the English language, was also notified. With the able assistance of these gentlemen, I felt I could not get far wrong in my investigations without meeting with a staying hand. Under their directions I made my tests. The above-mentioned gentlemen, accompanied by Mr. Charles A. Heinitsh, ex-president of the American Pharmaceutical Association, Drs. Frank M. Musser and Oliver Roland, of the Lancaster County Medical Society, visited my establishment on February 9, made such examinations as their time would permit, and requested the following affidavits covering the history of the case, with tests to that date:

County of Lancaster, ss:

On the eighteenth day of February, A. D. 1885, personally appeared before me, John W. Rich, a Notary Public in and for the Commonwealth of Pennsylvania, Henry Fletcher, to me well known, who being duly sworn according to law, doth depose and say:

I live on my farm about one mile from Marietta, Pa. Some time in January, 1885, I noticed an eruption on and around the udder of one of my Jersey heifers.

My son, who is my only assistant in caring for my stock, informed me she was scabby and ought to be greased. This was neglected; I concluded I had met the same disease in cattle many years ago. I had never been in Dr. Alexander's vaccine stables at Marietta, nor had he ever had a heifer from me. I believed this was cowpox, and mentioned my belief to one of my laborers, named Wm. Shields, asking him to mention the case to Dr. Alexander, who came out, and after examining the animal, stated that he believed it genuine cowpox. He removed all the crusts and matter he could get, saying he would test it and bring others to see it. I have no other knowledge of anything connected with the case.

[Signed] HENRY FLETCHER.

Emlen Fletcher, sworn: I am a son of Henry Fletcher, farmer, residing about one mile from Marietta, and assist my father at farm work and caring for his live stock. Some time in January, 1885, I discovered scabs on and about the udder of one of his Jersey heifers. I suggested to my father that she should be greased. Later, Dr. Alexander, of Marietta, called, and removed the crusts from her in my presence. I heard him speak of it as being an interesting case of cowpox.

[Signed] EMLEN FLETCHER.

Wm. Shields, sworn: On the twenty-eighth day of January, 1885, I met Dr. Alexander at the post-office in Marietta, Pa., and informed him of a case of cowpox at Mr. Henry Fletcher's which he ought to see; I told him that it was ripe. He asked me some questions about it and expressed himself doubtfully, but said he would go and see it.

[Signed] WM. SHIELDS.

Dr. Alexander, sworn: On or about the twenty-eighth day of January, 1885, Wm. Shields said to me, "Doctor, you ought to see a case of cowpox out at Henry Fletcher's." I had been to see a mistaken case in the county some time before, and went out expecting to correct another error; but instead I found a fine Jersey heifer with an eruption on and around the udder, very much like what I was accustomed to in my own stables among my inoculated cattle. I felt sure it was spontaneous cowpox at the eighth or ninth day. I secured the crusts and lymph as best I could, took it home and vaccinated a child three years old, and one heifer. I at once notified Dr. W. M. Welch, ex-president of the Philadelphia Medical Society, and the Medical News Commissioner to examine vaccine farms. I also notified Mr. L. E. Sayre, editor of the *Druggists' Journal*, and others. The first heifer inoculated from this spontaneous case took well, and was fully a day earlier. I then inoculated one heifer from this one and another from the spontaneous case. Both came earlier than with the old strain of virus. I also vaccinated three children in one family on the same day. A boy of six years with the spontaneous vaccine, a boy of four years from first heifer (one remove from spontaneous), a boy two years with my old strain. The first two were fully a day in advance, and fine typical cases. I am confident this spontaneous virus is more active than the old strain and believe it is owing to those having deteriorated from a long series of propagation from heifer to heifer.

[Signed] H. M. ALEXANDER.

Henry Connelly, sworn : I assisted in the inoculation of heifers with the spontaneous vaccine as stated above by Dr. Alexander, and noticed the above-mentioned changes as to time and appearance of those inoculated.

[Signed] HENRY CONNELLY.

Dr. J. M. Shartle, affirmed : At Dr. Alexander's request, some time in January, 1885, I went out to see the Jersey heifer said to have spontaneous cowpox. I compared it with what I had seen in Dr. Alexander's stables, and my diagnosis was cowpox. I also noticed the difference among those heifers inoculated with the new and old strains in his stables. I examined the arms of three children in one family tested by Dr. Alexander, and on the sixth day the spontaneous vaccinations were fully a day in advance.

[Signed] J. M. SHARTLE, M. D.

Sworn before me, Jno. W. Rich, Notary Public.

In conclusion, I have only this to say : My article as placed before you today is open to just criticism. I do not desire to place myself in the attitude of an authority, but I cannot agree that cowpox is swinepox, or horse-grease cowpox, or smallpox cowpox, but simply cowpox, a disease of that animal only, and originating spontaneously. Many points pertaining to the source of cowpox have been purposely passed by, fearing I would tire you with long details, knowing I have already consumed more time than has been customary with articles brought before you. Our libraries are very deficient in vaccine literature. Much needs to be written on its propagation, its sale, its successes, its failures and its ills.

DISEASES OF DOMESTIC ANIMALS COMMUNICABLE TO MAN.*

By Leonard Pearson, B. S., V. M. D.

That certain diseases are transmissible from animal to man, has been known for a very long time, but it is only during recent years that comparative pathology and veterinary science have revealed the true importance of this subject. At present,

* Read at the Sanitary Convention, Williamsport, Pa., May 21, 1896.

we know that there are a number of diseases that may be thus transmitted and infection may take place in a variety of ways. The most important means of communication are the following :

1. Association with diseased animals.

2. Accidental inocculation with the products of diseased animals.

3. Consumption of the flesh and milk of diseased animals.

Of all the diseases that belong to this category, *anthrax* is probably the best known. Fortunately, anthrax is not very common in this State, but it occurs sometimes and it is such a virulent and fatal affection, that the greatest care should be observed wherever it appears. Anthrax is interesting historically from the fact that it is the first disease proven to be caused by bacteria, and it has received far more attention from bacteriologists, than any other malady. The spores of anthrax bacilli are remarkably resistant organisms ; they can endure the extreme changes of our climate and will live outside of the body for years. This makes the disease a difficult one to eradicate and makes it essential that all cases should be dealt with promptly and thoroughly. The germ of anthrax is found in all parts of the body of its victims, and especially in the blood. If one makes a postmortem examination of a bullock dead of anthrax, or skins an anthrax carcass, he runs grave risk of infecting himself and, particularly, if there are any abrasions on his hands.

In man, the disease usually manifests itself as a local lesion at the seat of inoculation, known as a malignant carbuncle. I have seen a number of cases of this sort among veterinary surgeons, farmers, and others, who have handled animals suffering from anthrax ; and the medical literature is replete with instances of this nature. The malignant carbuncle makes a distressing sore that sometimes leads to general infection and death.

Anthrax is not rare among tannery workmen and woolsorters; in these cases it is contracted by handling the products of anthrax carcasses. The ingestion of the flesh of animals that were killed while suffering with anthrax, is accompanied by extreme risk, for, while the bacilli are probably killed by the gastric juice, the consumer might become infected through sores in his mouth, or the spores which are not destroyed by the gastric juice might cause infection through the intestines.

Since all of the domestic animals are susceptible to anthrax there is as much risk of infection in exposing horses or sheep to diseased cattle as when a man exposes himself.

Rabies or *Hydrophobia* is another well known disease that is transmissible from animal to man. In fact, I know of no cases of rabies of man, that were not due to infection from an animal. Although there are still a few individuals who doubt the existence of rabies, there cannot be a doubt on this question in the mind of anyone who cares to study it carefully.

Rabies is not only an actual disease, but it exists in many parts of Pennsylvania at this time. An extensive outbreak has recently been reported in Allegheny County, and a number of dogs, horses and cows have died from the disease. Some of the bitten people have submitted to treatment at the New York Pasteur Institute. There is a district near Philadelphia where rabies seem to be stationary, and very frequent outbreaks occur there. Some of the cases have received careful laboratory study at the Veterinary Department, University of Pennsylvania, and in this way the diagnosis has been proven.

Glanders is, primarily, a disease of horses, but it may be communicated to dogs, cats and men. The virulent character of glanders is so generally recognized that owners of glandered horses do not long hesitate to destroy them; so when the disease is diagnosed the subject does not, as a rule, remain alive to disseminate it. However, there are some unscrupulous persons who sell horses of this sort, and they pass from owner to owner infecting additional horses in every stable they occupy. Men are usually infected by receiving the discharges of a glandered horse in their faces or upon an abraded skin. The disease is very virulent and incurable in both man and animals.

Tuberculosis of cattle is a disease that has received a vast amount of attention during the past few years, and the public is pretty generally aroused to the dangers of consuming the flesh and milk of tuberculous cows. It has been shown by numerous investigations that the milk of tuberculous cows may contain the bacilli of tuberculosis. This is always the case when the udder is tuberculous, and may be the case in some instances when the disease is confined to organs other than the udder; and, as has well been brought out in the recent report of the Royal Commission on Tuberculosis, if the udder is

healthy in a tuberculous cow, it may become invaded in an almost incredibly short time, and thus the milk may, at once, become very dangerous. Hence, all tuberculous cows should be looked upon with suspicion, and unless their products are sterilized by heat they should be excluded from human consumption. The danger that attends the use of milk, from a tuberculous herd, is well known to veterinarians through the frequent appearance of intestinal tuberculosis in calves and swine fed upon it.

Actinomycosis is caused by the same parasite in both men and animals, and there are some who hold that this disease may be contracted by consuming the flesh of actinomycotic cattle. Although this theory is not fully established, we should follow a safe course and refuse to allow the sale of the flesh of cattle suffering with this disease.

Diphtheria was formerly thought to be a common disease of the lower animals, but since the discovery of the bacillus of this affection and the employment of accurate means for its recognition, it has been found that the old view was erroneous. However, there are a number of more or less perfectly demonstrated cases on record which tend to show, that in some instances, at least, animals have contracted true diphtheria. A case was recently reported by Dr. A. S. Wheeler, of New Orleans, in which a dog died of diphtheria, and the diagnosis was proven by the bacteriologist of the New Orleans Board of Health. Fowls are supposed, in some cases, to suffer from true diphtheria. At all events, much care should be used in treating animals with symptoms resembling diphtheria, and they should not be taken into houses and allowed to associate with children as is so frequently done.

There are a large number of parasitic diseases, both animal and vegetable, that may be transmitted from animals to man, that are so well known that it is only necessary to name them. The most important are tape worms, from hogs and from cattle; trichinæ, favus and ringworm.

There are some conditions of animals that lead to the production of certain toxic compounds in the flesh and milk that poison consumers, but do not cause the same disease from which the animal suffered. In most cases of high fever, the flesh and milk undergo certain changes or receive additions of certain substances that are very deleterious and sometimes fatal

to the consumer. Many of these evils can be avoided by a systematic inspection of slaughter houses and food animals and of dairies.

Such inspections are desirable from the standpoint of public health, but they would, also, be found to be of great benefit to farmers, because they would restore public confidence in the products of the dairy which, of late, has been so rudely shaken, and thus enlarge and improve the market.

The State Live Stock Sanitary Board is actively engaged in combating the infectious diseases of animals, and is making some progress in the direction above indicated but, as yet, it has not attempted a systematic inspection of the dairy cattle of the State.

COCCIDIA IN THE GALL-BLADDER OF A RABBIT.

By H. O. Sommer, Stud. Med.

Volunteer Assistant in the Zoölogical Laboratory, Bureau of Animal Industry, United States Department of Agriculture.

It is a matter of common knowledge to anyone accustomed to experimental work in medicine and zoölogy that the rabbit (*Lepus cuniculus domesticus*) frequently harbors parasitic sporozoa of the species *Coccidium cuniculi* (Rivolta, 1878)—more commonly known as *Coccidium oviforme*, Leuckart, 1879. These parasites develop in the epithelial cells of the bile ducts and after reaching the encysted stage fall into the lumen of these ducts and are carried to the intestine, from which they escape with the feces.

We would naturally expect that the encysted parasites would also be carried to the gall-bladder, but in an examination of a considerable number of articles upon this parasite, I have been unable to find any record of their presence in that organ. This leads me to publish a short note upon the subject covering a case of hepatic coccidiosis which I recently observed (May 15, 1896), in which the parasites were found not only in the bile-ducts and in the intestinal contents, but also in the gall-bladder.

Careful measurements showed that the specimens found in the gall-bladder were of the same species as the specimens in the liver.

While the above observation may not be the first of its kind, I here place it on record at the advice of Dr. Stiles.

The case is interesting to the student of medicine as well as to the zoölogist, since the same parasite is found in the human being.

VACCINE VIRUS.[1]

By H. M. Alexander, M. D.,
Marietta, Pa.

Nearly a century has elapsed since Dr. Edward Jenner, the discoverer of vaccine virus, inoculated his first patient, and proved to the world the efficacy of his theory of vaccination, as the preventive of that dreaded disease, smallpox. As has always been the fate of every new theory, invention or innovation in its infancy, vaccine virus met, for a time, with violent opposition, yet the learned Jenner lived to be feted in the streets of London, his path being strewn with flowers, and was finally tendered a testimonial of ten thousand pounds, by an Act of Parliament, in recognition of the great boon he gave to mankind. But important discoveries are slow to adoption, and owing to bigotry and superstition, are seldom appreciated fully in the age of the discoverer. The evolution of vaccine virus was, then, necessarily slow. Great difficulty was experienced in procuring vaccine from the animal, and the use of the crust, taken from one person and applied to another, which is known as humanized virus, or vaccine, was adopted. This method was continued for many years, when it was discovered that a great number of diseases, especially skin diseases, and the most vulgar ones to which the human system is heir, were being conveyed from arm to arm.

[1] Read before the Fourth Pharmaceutical Meeting of the College of Pharmacy, Philadelphia, Pa.

We shall pass over the history of the period which elapsed from the beginning of the nineteenth century until the propagation was begun in America in 1870, for the history of this period, as we glean it from the writings of many authorities, is very conflicting. Its efficacy as a protective agent was thoroughly proven in many instances, while there were others that left some doubts as to its ability to protect against the dread disease, smallpox. Our own experience has forced us to believe that these great deficiencies in protective power were largely due to the fact that humanized virus was much used, which in these cases of failure had greatly degenerated.

Sources of American Propagation.—Whether true cowpox was found among the cattle frequently prior to 1866 is not certain, but in that year a case was found in Beaugency, France, and it was from this strain that bovine virus was imported into America, and its propagation from heifer to heifer introduced into the United States in 1870, by the late Dr. Henry A. Martin. In the decade which followed, the propagation of vaccine virus was begun in various sections of the country. The methods employed, however, were of the crudest nature, and much of the propagation of a dangerous character. In many instances propagation is still carried on in unclean stables, located in filthy city alleys, where the virus produced is of necessity subjected to dangerous contamination of the surrounding filth; the cattle are usually procured from city stockyards —generally heifers—but very frequently decrepit old cows that have shown some organic weakness. Only an external examination of them can be made, and naturally disease, particularly tuberculosis, is not always avoided. As aresult the greater portion of the virus procured in this way, instead of affording protection against smallpox, merely produces ulcers of a dangerous and most painful nature.

Location of Vaccine Establishments.—It is important that an establishment for the propagation of Bovine Virus should be located in the open country, where the advantages of pure air and perfect cleanliness can be found, and where every possible sanitary condition can be had. The buildings should be erected especially for, and devoted exclusively to, the propagation of vaccine virus. They should be models of perfection and completeness, while the water supply should be well filtered, and absolutely under the control of the propagator. Ample room

should be given, that no crowding of cattle be called for. The operating should not be done in the stables, but should be in a spacious room, well ventilated, free from filth of every description, and perfectly dry, for dampness is an avowed enemy to vaccine virus. The stables wherein the cattle are housed should be clean, pure and entirely free from foul or impure air.

The Proper Selection and Preparation of the Cattle.—Instead of buying cheap, diseased, or decrepit cattle from city stock yards, the better plan is to rent heifers from one to two years of age, being reared by the farmers of the surrounding country for their future milkers. This enables us to use generations of the same stock, and therefore know all about them, giving the advantages of learning of the existence of any hereditary diseases that might naturally be overlooked in the most careful examination of the animal itself. When the heifers are brought to the farm, the first thing is to give them a close examination, then place them in the stables, groom carefully, and feed on bran mashes, until it is determined they are ready to become subjects. They should then be led to the operating room and fastened. The method of this fastening differs greatly, but the one which I show you on the photographs distributed has proven in my own hands by far the most satisfactory. By a simple mechanical arrangement the animals are easily turned over, resting on the strong portions of the ribs, near the vertebral column. They rest easily on these upholstered tables, and do not struggle, while all is done in a manner which preserves them from excitement. The inner portion of the flanks, back and above the udder, are then well shaven and inoculated with vaccine taken from a former subject. This portion of the body is selected as it is the easiest to be kept clean, and does not chafe. In some establishments the udder is selected, but experiments have conclusively proven that the udder is too warm a location, and usually results in confluence and malignancy. The abdomen, which is also sometimes selected, offers the same objection, as the animal cannot lie down to rest without lying on some of the vesicles, and developing excessive heat. After the inoculation, the heifers are taken to specially prepared stalls, where they are cared for and watched closely for an average of seven days and nights. When the vesicles are fully developed the animals are returned to the operating room, the

crusts are then removed with the handle of a scalpel, and the vesicles are thoroughly cleansed by sponging, and all foreign and impure matter removed.

Preparing the Points.—The ivory points which are to receive the lymph which is now exuding from the vesicles, should be sterilized. They should then be placed in clamps of fifty each, so that the operator is not obliged to touch the points with his fingers. The points are coated by applying with a camel's hair brush with which the operator absorbs the virus as it exudes from the vesicles. The points are coated twice, with the virus of two animals. The vesicles should not be irritated by the repeated application of the point to the surface, as is the case in most establishments, and which causes them to exude much serum, while the repeated handling of each point causes great danger in the way of septic poisoning. Besides this, when fifty points in one of these clamps are coated with one and the same brushful of virus from one animal, and recoated with another brushful from another animal, they will all be alike, which is not the case if the vesicle is irritated by a repeated application of hundreds of points to the tender surface. They should be carefully inspected, packed in glass, and bear the label of the propagator. Unscrupulous propagators do not, as a rule, label their goods, but conceal their identity, which should always be a good reason for discarding them.

Selling the Points.—Rate cutting and the great clamor of the cheap druggist, or the demand of sharp competition, have caused ivory points coated with mucilage to be placed upon the market at a very low figure, thus driving the real article out for a time. These knaves, then finding that the total failure of their goods gave them much trouble, and that the druggists returned to the legitimate ones, added croton oil to their mucilage which causes a vesicle to form. The patient tells the physician that his arm is sore, and he, accepting the statement, believes the vaccine to have been all right, while the fact that it acts so quickly proves its worthlessness.

Cause of Failures.—This brings us to the cause of failures being reported, not only where there has been actual failures, but where the physicians have failed to wait long enough before making their reports. Not only do failures certainly result from the use of impure materials, but they also occasionally result from those of good source. Some few cases are insusceptible,

but not many. Secondary vaccinations fail because they have been previously vaccinated, and are still protected. Other failures, even in primary vaccinations, are sometimes due to the fact that the virus was shipped in an over-heated car, and hence spoiled in transit. A still more frequent cause is that the virus is exposed to excessive heat or moisture in the office or store of the druggist, or by the physician carrying it in his vest pocket. It can be guaranteed for sixty or ninety days, for vaccine is not injured by age as frequently as is generally supposed, if kept in cool, dry apartments. In fact, we send it to China, Hindoostan and Palestine with success. Many physicians fail in consequence of their method of operating. We do not want to say that our method of vaccination is the best, but we will give what we have found to be the most successful manner of proceeding, and also why we think others have failed.

How to Vaccinate.—Our plan is to scarify the part thoroughly by scraping off the scarf-skin, and scratching the surface thus abraded in two directions, roughening it, so as to get the lymph retained close to the mouths of the absorbent vessels. The portion scraped should not be too large, as too large a surface often results in great violence, or an ulcer is produced where a simple vaccination was intended. We touch one side of the ivory point in a drop of water, shaking all possible off again, then apply it by rubbing it well upon the scarified surface, depending largely for our moisture upon the amount of serum which exuded from the scarification, to dampen it, and aid us in removing the virus from the ivory point. Often this serum, with the water we have used, is excessive, when we can readily form a paste by the use of the other side of the ivory point which was not dampened in this manner. We are certain of getting a sufficient number of vaccine corpuscles within reach of the mouths of the absorbent vessels, and to finish the operation we gently prick or scratch the arm with the point we have just used. Many physicians use too much water, and are unable to form a paste, the little corpuscles floating off, and being very glutinous, adhere to the skin; the physician thinks he has gathered them up, and finishes by getting all he can upon the scarified surface, but does not succeed in getting much else than the serum; the absorbent vessels exhaust themselves absorbing this material, and fail to get in any of the

corpuscles required. Again, we have known of paste, when not finished by pricking it in, to have dried as a varnish beyond the reach of the absorbents, which had been closed by the rubbing process.

Another cause of failure is that hosts of physicians clamor for colorless points, forcing the propagator to give them as little as possible, in order to keep away from color, and then they use one point to two patients, when it was only intended for one.

Violent Results.—Violent results occur from the use of lymph containing filth, the use of irritating drugs, and the use of virus that has been removed from the animal at the wrong time, for it should be taken early. They also occur from the use of cattle that are too old, which yield a great deal more virus, but which is unnecessarily strong and irritating. Again, the violence may result from the neglect of the physicians to cleanse the arm prior to vaccination, or the use of an unclean lancet; that is, one used continuously, without being disinfected. The best way to disinfect a lancet is to dip it into alcohol after each application, and then touch it to a flame; but a more frequent cause of violent arms comes from the practice of dressing the arm after the operation by means of cotton and adhesive strips. There is not the least doubt but that this imprisoning, as it were, is causing the most mischievous results, and often death. We emphatically say, keep the arm loosely clothed, put no dressing upon it, unless it is a protection shield properly made, and advise the patient to use the arm as little as possible, and keep it clean. With good vaccine and the proper care you will have very few bad cases, unless you can find a very marked syphilitic history in your patient. Our experience has proven that syphilitic families with a decided history have shown a strong tendency to violent action.

Summary of Dangers.—To sum up the dangers we might say that they come, first, from the improper selection of cattle; second, from the filthy condition of the establishments in which they are kept; its dangerous location; the plan of procuring virus by pressure, and by carrying it to another apartment, after having been removed, instead of putting it on the ivory points warm, and allowing it to dry quickly. Packing it in dangerous materials for the sake of cheapness, the propagator

either wanting to avoid correspondence with the consumer, or else, ashamed of his goods, fails to put on his label. The druggist and physician looking for goods that cost less than ten cents a vaccination, sacrifices the lives of their patrons by buying dangerous vaccine, or that which is not vaccine at all, because it is sold to them at a cut rate. The druggist may keep a good article too long; it can always be exchanged for fresh without extra cost—this would be simple carelessness on the part of the dealer; the physician retaining the goods in a vest pocket, or hot office; neglect of cleanliness in operating; want of knowledge of a proper method, and an over-anxious desire to protect the arm.

When is the Physician Safe?—How shall the physician know when he is safe, and how shall he obtain the best results? First, by keeping in touch with the best propagators. Ascertain for a certainty that they have the proper kind of establishments, and exercise the proper care. Let the physician buy from a druggist upon whom he can depend, being certain that he is not getting cut-rate goods; be sure that the goods bear the label and full address of the propagator, that he may be able to correspond with the producer should he have any difficulty, either from failure or excessive action. Let him await for results of bovine virus from five to eight days, and never report until ten full days have elapsed, and to look with suspicion upon anything that acts on the second, third or fourth day. In this way he can avoid many of the dangers, and protect his patient, as well as help overcome the fraudulent practices of those who care not for the health of their fellow beings.

How to Remedy by Inspection.—It has been suggested that the government assume control. To assume the role of propagator would, in this country, be a greater failure than it is today in those countries that have tried it. We are exporting vaccine today, because it is pronounced superior to theirs, and I was informed this summer at Chicago by their own people that the government virus was not generally used by the intelligent classes. State propagation is not practicable for the one reason, if no other, that there is not sufficient demand to enable the propagator to keep up a continuous strain of propagation, or carry sufficient stock to be able to meet the demand when it arises. I would suggest a National Board of Health, composed

of one member from each State Board, they to appoint inspectors from their number, whose duty it would be to thoroughly inspect every vaccine establishment of the country, and to allow no vaccine to be sold without a registry number, guaranteeing to the druggist, the physician, and the layman that the article he buys, uses, or has used upon himself or his children, has received the sanction of the proper authorities. Then, and not till then, can compulsory vaccination be justly enforced.

VETERINARY MEDICINES.

THEIR NATURE, PROPERTIES AND DOSES.

By Hon. Thomas J. Edge,
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Castor oil.—The expressed juice of the castor oil plant; the cold-pressed is most valuable; the seeds are a dangerous poison if taken in any great amount; it is a mild cathartic and particularly useful in the treatment of cows about to calve or such as are subject to milk fever; may be safely given in all cases where a purgative is required, and is, perhaps, the safest of its class. Horse, one pint; cow, one and one-fourth pints.

Calomel (*sub-chloride of mercury*).—Used as a purgative, but is somewhat dangerous on account of the increased liability to colds during its use; in small doses it acts as an alterative. As a purgative: Horse, one dram; cow, two drams. As an alterative: Horse, one scruple; cow, two scruples.

Camphor.—Obtained by boiling the wood and roots of an evergreen tree (*Laurus camphora*), growing in the East Indies; soluble in alcohol; acts as a sedative, antispasmodic, and diaphoretic; allays nervous excitement from any cause; is useful in causing sleep; is a valuable addition to ointments and liquid applications for sores of all kinds. Horse (internally), one and one-half drams; cow, two drams.

Cayenne pepper.—Acts as a powerful stimulant; combined with other remedies, it is often used to increase vital action; it is a stimulant to the stomach and bowels; useful in colds and

catarrh ; applied to the skin it is a counter-irritant and produces, to a limited extent, the same action as mustard. Horse (internally), two and one-half drams ; cow, three drams.

Carbolic acid.—Acts as an antiseptic, astringent, disinfectant, and a sedative ; diluted with water and applied to ulcerous sores, it acts as a disinfectant ; to wounds, it acts as an astringent. Horse (internally), three-quarters of a dram ; cow, same dose.

Catechu.—Extracted from a tree growing in the East Indies (*Acacia catechu*) ; is a powerful astringent, and is used in chronic diseases of the bowels ; also used in cases of hemorrhages of the bowels ; as an infusion, it is useful for cracks in the skin, sore teats, sore mouth and kindred troubles. Horse, three drams ; cow, four drams.

Chloroform.—Internally as a stimulant ; inhaled, an anesthetic ; dangerous in inexperienced hands ; remedy for over applications, the inhalation of ammonia ; internally, it is used as a sedative in spasmodic diseases of the throat and bronchial tubes ; externally, as a liniment it may be used for all kinds of painful sores or ulcers. Horse (internally), one and one-half drams ; cow, same dose.

Cinchona (*Peruvian bark*).—Obtained from several varieties of trees of the Cinchona family growing in South America ; as sulphate of quinia, it is used largely as an anti-periodic and stimulant ; for intermittent fevers it is invaluable ; it also acts as a mild tonic and as an antiseptic ; equal parts of sulphate of quinia and tartaric acid dissolved in water, form an excellent cooling lotion to all kinds of indolent ulcers. Horse (internally), two drams ; cow, same dose.

Chamomile.—The flowers of a common plant (*Anthemis nobilis*), dried and used as a tincture, acts as a tonic and stimulant; flowers should be gathered before they have assumed the yellow tint; useful in all cases of irritation of the stomach and bowels; given warm, it acts as an emetic, and in connection with other emetics, will increase and quicken their action. Horse, one ounce; cow, one and one-half ounces.

Chloral hydrate.—A solution of chloral in water decreases the action of the heart; lowers the temperature of the body; lessens respiration; varies somewhat in its action with different patients; dangerous unless its action and effects are perfectly understood. Horse, one-third of an ounce; cow, same dose.

Colchicum.—From the seeds and bulbs of an English plant (*Colchicum autumnale*); made by steeping these portions of the plant in alcohol, wine or vinegar; in large doses is a dangerous narcotic poison; used in the form of a tincture, it is beneficial as a sedative, cathartic and diuretic; useful in all cases of a rheumatic nature. Horse, one-half dram; cow, one dram.

Columbo.—The product of an East African plant (*Cocculus palmatus*), the root is powdered and reduced with alcohol and the solid drug obtained by evaporation; it is an excellent tonic; excellent in cases of dysentery and diseases of the intestines; an American plant possesses the same properties, but to a less degree. Horse, two drams; cow, one-quarter ounce.

Croton oil.—A somewhat dangerous purgative unless its action is well understood; mainly used after the failure of other and milder purgatives; obtained from the seeds of an East Indian plant (*Oleum tiglii*); if mixed with olive oil and applied externally it causes irritation; for external application it should be mixed with four parts of olive oil; should not be used by the amateur practitioner. Horse, ten drops; cow, twenty drops.

Cantharides (*Spanish flies*).—Act as a diuretic and stimulant; a dangerous remedy if not properly given and understood; likely to cause complications in the urinary organs. Horse, four grains; cow, seven grains.

Cream of tartar.—Acts as a mild diuretic, and is a safe and non-injurious remedy; should be dissolved in water; is a valuable application in cases of sore throat. Horse, one ounce; cow, one and one-half ounces.

Cod liver oil.—Acts as a tonic; aids the digestive organs and stimulates their action.

Digitalis.—Prepared from the leaves of the Foxglove (*Digitalis purpurea*), which grows in many parts of Europe; in large doses, it is a dangerous narcotic poison; in proper doses it is a sedative, diuretic and reduces the action of the pulse; its effects should be closely watched, for it has the reputation of accumulating in the system, and of thus producing unfavorable results when least expected; overdoses may be counteracted by the free administration of emetics and the use of ammonia and other stimulants. Horse, fifteen grains; cow, one-half dram.

Dandelion.—An almost universal perennial plant which has diuretic properties, and which also acts as an aperient; mainly useful in diseases of the skin and digestive organs; known a

taraxicum; roots should be gathered in the autumn. Horse (extract), one ounce; cow, one and one-half ounces.

Ether (*Sulphuric ether*).—Acts as a stimulant and antispasmodic; is highly inflammable and must not be brought near a light; dangerous in inexperienced hands; used for cramp and spasms of the stomach; used externally and allowed to evaporate rapidly; it is a refrigerant. Horse, one and one-half ounces; cow, two ounces.

Ergot.—Produced by a diseased condition of rye, known as smut or spurred rye; mainly used to produce contractions of the uterus; if given in too large doses, or if moderate doses are continued for too long a period, it is apt to produce alarming symptoms; used in some cases to check hemorrhages, but its effect for this purpose is doubtful. Horse, one-half ounce; cow, three-quarters of an ounce.

Elecampane.—Prepared from the root of a Japanese plant (*Inula Helenium*), and is sometimes grown in this country; the native plant does not produce the same effect as that imported; roots should be gathered in the autumn of the second year of their growth; applied externally, the decoction acts favorably in skin diseases. Horse (powdered root), eight drams; cow, ten drams; horse (decoction), four fluid ounces; cow, five fluid ounces.

Flaxseed.—Two ounces of the seed infused in a quart of hot water forms a mild laxative, and may be safely used in mild cases of diseases of the intestines and stomach; may be given in the form of linseed oil in pint doses, twice each day.

Feverfew (*Pyrethrum parthenium*).—Leaves are used as an infusion in cases of colds, worms and urinary diseases; may be given freely as an infusion, or as a diluent for other remedies; acts as a tonic, and is useful to relieve pain in the intestines.

Ginger (*Zingiber officinale*).—The powdered root of an East Indian plant, and is also produced in the West Indies; used for diseases of the bowels and digestive organs; is also used in connection with other remedies, as a poultice for indolent sores. Horse, one ounce; cow, one and one-half ounces.

Glauber salts (*Sulphate Soda*).—Acts as a cathartic, and if in small dose, as a diuretic and laxative; much used as a cathartic. Horse, one-half pound; cow, one pound.

Gentian.—Used as a tonic and promoter of the appetite; made from the root of a European plant (*Gentiana lutea*); must not be

given in cases of inflammation of the stomach or intestines; larger doses cause vomiting; sometimes used as a vermifuge. Horse, four drams; cow, one ounce.

Galls (*Oak*).—Used in the powdered form, in cases of severe diarrhea; acts as an astringent, and forms one of the most powerful; their action is increased by the addition of a small portion of alum; useful as an injection in cases of prolapsus ani; one of the best remedies for an overdose of tartar emetic. Horse, five drams; cow, one and one-fourth ounces.

Garlic (*Allium sativum*).—Acts as an expectorant, stimulant, diuretic and sedative; the root is the portion used; macerated in water and boiled, or may be given in the dry form; used in some cases as a counter-irritant; onions may be substituted in all cases in which garlic is prescribed.

Ginseng.—The root of a perennial plant, growing in the Middle and Southern States; acts as a mild tonic and stimulant; is seldom used in veterinary practice, the stronger stimulants and tonics being preferable on account of the smaller doses required to produce a given action; sometimes used as a vermifuge.

Hemp-Indian (*extract*).—A resinous exudation of the hemp (*Cannabis sativa*); acts as an antispasmodic, a suporific and narcotic; in large doses is dangerous, producing a peculiar kind of intoxication; is said to be a promoter of appetite; sometimes used in cases of rheumatism and colds. Horse, three-quarters of one dram; cow, one dram.

Henbane (*Hyoscyamus, extract*).—The product of a biennial plant of Southern Europe (*Hyoscyamus nigra*) known as Henbane; the leaves produced during the second year are used; in large doses, it is a narcotic poison of a dangerous character; acts as an anodyne, antispasmodic and narcotic; sometimes added to cathartic remedies to prevent bad after effects; diminishes pain and, in some cases, induces rest by allaying nervous excitement; is often substituted for opium in practice, as it does not cause constipation; used for rheumatic affections. Horse, two drams; cow, three drams.

Horse-mint.—A well known and common plant; leaves and smaller stems are used; acts as a carminative, stimulant, sudorific and mild diuretic; is used in many digestive troubles, and is supposed to prevent or relieve the formation of gases; produces perspiration and acts as a mild emetic. May be given in the form of an infusion in large amounts.

Horse-radish.—Root and leaves (if picked while young), act as an emetic if infused and given warm; useful in rheumatic affections; also promotes digestion; useful in an enfeebled condition of the digestive organs, but, if continued for a great length of time, acts too much as a stimulant.

Iodine.—Prepared from the ashes of sea weed; internally, it acts as a diuretic and alterative; externally, it subdues and prevents the spread of skin disease; applied to the outer rim of ulcers and sores, it gives relief from the pain; in large doses it is a dangerous corrosive poison; not to be used by the amateur as an internal remedy; safe as an external application. Horse (internally), twelve grains; cow, fifteen grains.

Ipecacuanha.—Prepared from the root of a perennial plant growing in South America; in modern doses it increases perspiration and diminishes arterial action; in small doses it promotes digestion and acts as a tonic; combined properly with opium, its properties appear to be intensified and increased; if mixed with olive oil and rubbed on the skin by prolonged pressure and friction, counter irritation may be produced. Horse, five drams; cow, same dose.

Iron (*peroxide, carbonate and iodide*).—Used mainly as a tonic; most safely administered as a carbonate or sulphate; in the form of a sulphate it is an irritant, tonic and astringent; in a solution of eight grains to a fluid ounce of water, it is an excellent application to all eruptions on the skin; in overdoses, it acts as a poison. In the form of an iodide, it must be given in much smaller doses; in fact, this form should be avoided by the careful practitioner. Horse (sulphate and carbonate), three drams; cow, four drams.

Jalap.—The root of a Mexican plant (*Ipomea jalapa*), acts as a cathartic; in large doses it produces griping and nausea; if a few grains of cream of tartar is added, all of its properties are increased; it should never be used in cases involving an inflammatory condition of the intestines; useful in all swellings of the limbs. Horse, five drams; cow, same dose.

Juniper (*berries*).—Act as a stimulant and a diuretic; may be given in the form of dried berries or in that of an expressed oil. Horse (berries), nine drams; cow, ten drams; in an oil, horse, fifty drops; cow, same dose.

Kino.—From the juice of an East Indian tree (*Pterocarpus marsupium*), a somewhat strong astringent; used in cases of

diarrhea, and may be substituted for almost any other astringent found in veterinary practice; the powdered kind, if blown into a wound or into a bleeding nostril, has the power of retarding or stopping the flow of blood; lint powdered with it and placed on or in a wound, will produce excellent effects; sometimes given in the powder form and sometimes as a tincture. Horse, one-half ounce; cow, three-quarters of an ounce.

Laudanum.—The concrete juice of the seed vessels of the poppy; causes giddiness, nausea, tremors and nervous derangement in various forms; usually accompanied with constipation, and is therefore to be avoided, if possible; in large doses, a dangerous remedy; the antidotes are strong coffee and external counter irritation. Horse, one ounce; cow, one and one-half ounces.

Lime water.—Mainly used as an antacid and corrector of flatulence and kindred troubles; in large doses, it acts as an astringent. Horse, four and one-half ounces; cow, five ounces.

Lead (*Acetate of lead*).—Better known as sugar of lead; dissolved in water in the proportion of four grains to the fluid ounce of water, it forms an excellent external application for inflammation of the eyes and nostrils; sometimes given internally to check hemorrhages, but its use for this purpose is of very doubtful utility; is also used as a sedative and an astringent. Horse (internally), one scruple; cow, two scruples.

Linseed oil.—See flaxseed; used as a laxative. Horse, one and one-half pints; cow, two pints.

Lobelia.—Prepared from the leaves and seeds of the *Lobelia inflata;* acts as a nauseant, expectorant, antispasmodic and sedative; useful in obstinate coughs and disease of the throat and lungs; given to produce relaxation of the muscles and in cases of lockjaw; mixed in a poultice with elm bark, it is a useful application to fractures and all cases involving external inflammation; in too large doses it will cause inflammation of the stomach and intestines. Horse, one and one-half drams; cow, two drams.

Logwood.—The wood of a tree growing in tropical America; acts as an astringent and non-irritating tonic; colors and otherwise affects the urine; should never be given with lime water or chalk.

Magnesia.—Used to correct acidity of the stomach, formation of gases and indigestion; if given in cases where acidity does

not exist, it will, in sufficient doses, act as a purgative; used in other forms. Horse, one and one-half ounces; cow, two ounces.

Magnesia (*Sulphate*).—Better known as Epsom salts; a purgative and laxative; more used than any other purgative. Horse, one-half pound; cow, one pound.

Mandrake.—The roots of the May-apple (*Podophllyum peltatum*), is a cathartic, emetic, alterative and laxative; has the same effects as jalap; often used in affections of the liver and causes a healthy flow of bile; given either in the form of the powdered root or as a tincture.

Mustard.—Given internally, acts as an emetic and irritant; applied to the skin, causes counter irritation.

Myrrh.—The gummy and resinous juice of a tree growing in Arabia; acts as a stimulant and tonic; useful in diseases of the throat and bronchial tubes; increases expectoration. Horse, three drams; cow, four drams.

Nux vomica.—From the seeds of an East Indian tree (*Strychos Nux vomica*); is an energetic poison and a dangerous remedy; causes twitching of the muscles; the active principle is the alkaloid strychnia; camphor, sweet oil and salt are the best antidotes. Horse, fifteen grains; cow, twenty grains.

Nitre (*Nitrate of potassa*).—In large doses is a dangerous irritant; safest when administered in mucilaginous drinks; quite effective as a diuretic, and the one most commonly used; in certain diseases it acts as a stimulant. Horse, six drams; cow, eight drams.

Oil of turpentine.—Is an irritant, stimulant, cathartic and diuretic; increases the flow of urine, and reduces mucous discharges; mixed with castor oil forms an excellent vermifuge; is used in lotions as a counter-irritant; sometimes used in inflammation of the bladder. Horse, one-half an ounce; cow, one ounce.

Olive oil.—Given as a mild laxative; used in coughs and catarrh; much used in the composition of liniments. Horse, one and one-half pints; cow, two pints.

Opium.—See laudanum; narcotic, sedative and antispasmodic. Horse, one-half ounce; cow, three-fourth ounces.

Peppermint (*oil*).—Prepared from the common peppermint (*Mentha piperita*); a stimulant, antispasmodic, carminative and stomachic; valuable to check nausea; the weak and warm

infusion may be used in large amounts; excellent in all cases approaching spasmodic action. Horse (oil), twenty drops; cow, twenty-five drops.

Pepper (*black*).—Used as a stimulant and stomachic; red pepper most used. Horse, two drams; cow, two and one-half drams.

Potassa.—Usually given in one or more of its seven forms, viz.: acetate, bicarbonate, nitrate, chlorate, iodide, bromide and cyanide; amount varies with the form used and the cases to which it is administered. Of the nitrate and bi-carbonate, horse, seven drams; cow, one ounce. Cyanide and chlorate, horse, three drams; cow, same dose.

Quinia (*Sulphate*).—See cinchona.

Rhubarb.—Obtained from the rhubarb plant; the best roots are those obtained in Russia and Turkey; an active cathartic and astringent; in small doses it acts as a laxative; if burned, its astringency is increased, but its purgative properties are decreased. Horse, one ounce; cow, two ounces.

Strychnia.—The active principle of nux vomica; a nerve tonic; a dangerous poison in over doses; used in cases of nervous debility and rheumatism. Horse, one and one-half grains; cow, same dose.

Squills.—In small doses causes nausea and depression of the pulse; in large doses a dangerous irritating poison; must never be given when inflammation is present in any form. Horse, one-half dram; cow, same dose.

Spanish flies.—See cantharides.

Sodium chloride (*common salt*).—A tonic, alterative, purgative and vermifuge; sometimes given to check hemorrhages, but of doubtful utility; mixed with mustard is one of the best emetics to remove poison from the stomach. Horse, one and one-half ounces; cow, two ounces.

Silver nitrate (*Lunar caustic*).—Acts as a nerve tonic; seldom used and dangerous unless well understood; sometimes used as an external application to warts and excrescences of various kinds. Horse (internally), five grains; cow, six grains.

Stramonium.—Leaves and seeds of the Jamestown weed (stink weed); in large doses is highly poisonous; in proper doses it acts as a narcotic, anodyne and sedative; the fresh leaves, bruised and applied externally, form an excellent poultice for rheumatic complaints; in ointments it is valuable in

skin diseases. Horse (internally), twenty grains; cow, three-quarters of a dram.

Sulphuric acid.—A dangerous remedy in inexperienced hands; is a tonic and caustic; is sometimes used as a refrigerant; sometimes used, very much diluted, as an application externally to diseases of the skin. Horse, one dram; cow, two drams.

Sulphur.—Usually given in connection with cream of tartar; is used as an ointment for itch and skin diseases; mixed with coal oil, is excellent for lice on cattle; if too much coal oil is applied, it may remove the hair; sometimes administered in rheumatic troubles. Horse, three ounces; cow, five ounces.

Sweet spirits of nitre.—Is a stimulant, antispasmodic, diuretic and diaphoretic; the inhalation of the vapor is dangerous; must not be kept for any great length of time, for it then not only loses its valuable properties, but also acquires some that are disadvantageous. Horse, one ounce; cow, two ounces.

Soap (*household article*).—Acts as a diuretic, laxative, antacid and tonic; the pure forms of castile soaps are best. Horse, one and one-half ounces; cow, two ounces.

Tar.—Used as an expectorant and antiseptic; valuable in chronic coughs; the inhaled vapor is beneficial in bronchial troubles. Horse, three-quarters of an ounce; cow, same dose.

Tobacco.—A narcotic, sedative and antispasmodic; used in ointments for skin diseases; the oil is an active poison. Horse, four drams; cow, same dose.

Turpentine.—See oil of turpentine.

Tartaric acid.—See cream of tartar.

Valerian.—The root of a perennial European plant (*Valeriana officinalis*); is a tonic, antispasmodic and vermifuge; in large doses it causes nervous disturbances. Horse, two ounces; cow, three ounces.

Veratrum.—A dangerous remedy in unskillful hands; not to be used except by advice of the veterinarian; acts as a sedative. Horse, one scruple; cow, one-half dram.

Venice turpentine.—Properties, effects and doses same as oil of turpentine and turpentine.

Zinc (*sulphate*).—Sometimes used as an emetic, but mainly used as an ingredient of ointments for external application. Horse, one and one-half dram; cow, two drams.

ON THE VALUE OF THE COMPARATIVE METHOD IN THE STUDY OF PATHOLOGY.

By Roswell Parke, A. M., M. D.,
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[Begun in May Number.]

Accepting, then, the pineo-pituitary-infundibular passage-way as marking the site of the original anterior communication, let me again refer to the posterior communication between the neural and enteric canals, this being the lower part of the original U-shaped tube already alluded to. Here, first of all, is Luschka's gland, a mass of lymphoid tissue marking the site of the obliterated passage. The first to appreciate the true character of congenital coccygeal tumors and to associate them with this canal was Middledorpf[1]. These tumors, like all others developing from this lymphoid tissue, always assume dermoid characteristics, and are for the most part situated between the rectum and the cecum, though when large they may make their way into various parts of the pelvis. (For example, I have lately successfully removed one from a man of fifty, which had pushed its way from within entirely out of the pelvis and had raised a conspicuous and tender prominence in the gluteal region which almost completely disabled him. After removal it weighed four pounds.) These dermoids intrude themselves in all directions within the pelvis, and curious instances are recorded, many of them in the *London Pathological Transactions*. To the same general class belong also most of the congenital coccygeal tumors which figure in the monographs of Calbet[2] and others.

Per contra, equally well-marked dermoid tumors are met with in the original location of the infundibulum, especially in connection with the pituitary body. They have been described also as growing from the body of the sphenoid and projecting into the orbit or in other directions.[3] And the same is true also of the lower end of the infundibular canal, dermoid tumors

[1] Virch. Arch., vol. ci. p. 37.

[2] "Contribution a l'Etude des Tumeurs Congénitales de la Region Sacro-coccigienne," Paris, 1893.

[3] Lawson: *Path. Soc. Trans.*, vol. xxxv., p. 379.

being often found in the vault of the pharynx; while adenomatous enlargement of the pharyngeal tonsil is extremely common, particularly in children.

The origin of dermoid tumors from this original lymphoid tissue in the neighborhood of obsolete canals has equal interest and importance in considering the embryology of the thyroid body, which arises as a separate diverticulum from the anterior wall of the pharynx or floor of the mouth. In all but the lowest forms of vertebrates this diverticulum becomes completely shut off, and the duct leading to the developing thyroid is early rendered obsolete. In man it persists for a short time in the embryo, and is known as the thyro-hyoid duct, first described by His. By the time the hyoid bone has developed this duct has divided, that portion above becoming the lingual duct, that below remaining as the thyroid duct. This latter is often known as the *processus pyramidalis*, since it usually contains muscle-tissues, and has been described in most text-books of anatomy as the levator of the thyroid. When either of these ducts persists the fact is usually known by continuous shedding of epithelium, and perhaps discharge of sebaceous material. At times the ducts dilate into cysts of considerable size. Thus, I have recently had occasion to exsect such a cyst, the size of a hen's egg, from the floor of the mouth and base of the tongue in a young woman. The thyro-lingual duct originally opened upon the tongue at the point where now we have the lymphoid tissue known as the lingual tonsil. Along this location dermoids often develop, which may be central, unilateral, or bilateral, the central dermoids appearing, for the most part, as retention-cysts in the original thyro-lingual canal. It is worth while to remind you also that in case of epithelioma developing in this neighborhood the malignant process may extend rapidly down this canal and produce a perforating ulcer of the tongue—a melancholy instance of which recently occurred in a prominent officer of the army medical corps.

The thyroid duct should also completely disappear, but may persist, either as a duct extending from the thyroid isthmus to the hyoid bone, usually surrounded by muscle-tissue; or as a canal obliterated in the main, but presenting interrupted dilated portions—*i. e.*, a series of cysts; or, lastly, it may be represented by a series of detached bodies, known ordinarily as accessory thyroids. These supernumerary thyroids are to be regarded

always as the persistent remains of this original passage, and not in any other light. Both in the persistent or obliterated track, as well as in the thyroid body itself, cysts are most prone to develop, varying much in size, contents, rapidity of growth, etc. Some are multiple; some are single. The most interesting of them all are the dermoids, which are intimately related in structure to those dermoids found in connection with Luschka's gland and the post-anal gut. Fifty years ago von Ammon dealt with these in his remarkable treatise, and they have been frequently met with since then.

Another of the obsolete canals in the body to which too little attention is generally paid is that known as the vitello-intestinal duct, which originally connected the yolk-sac outside the embryo with the developing alimentary canal. This occasionally fails to become obliterated as it should, and may then present either as a protruding vascular tumor at the umbilicus or as a form of umbilical and fecal fistula, or as a dermoid located within the abdominal parietes. (I have had occasion within a short time to operate on a young man who had had nearly all his life a discharging sinus from the umbilicus, into which a probe would pass three or four inches. Upon abdominal section, I found a minute external opening connecting interiorly with a good-sized cavity lined with epithelium, and this, again, connecting with the small intestine by a trifling orifice. The extirpation of the sac and the sinus with intestinal suture was sufficient to obviate completely the difficulty.)

Another form of umbilical fistula is that represented by pervious urachus. This is so commonly dealt with in text-books that, beyond reminding one that the urachus may be in part obliterated but presenting cystic dilatation in some portion, or that just at the outlet it may be connected with a dermoid growth, I will not detain you with its consideration.

The subject of branchial fistulæ is also one of great interest. This is now quite thoroughly dealt with in works now before the profession and need call for but little attention here. Their study and recognition are entirely matters of the present century, for the most part of the latter portion. Heusinger made a most marked advance when, in 1864, he analyzed forty-six examples of the malformation (*Virch. Arch.*, vol. xxix.). These branchial fistulæ are the persistent remains of the original branchial or gullet clefts, and at present persist only among

the fishes. They should all be closed long before birth, save only the first, which forms the tympanic or Eustachian canal. When the second remains open, in whole or part, it opens usually between the angle of the jaw and the sterno-mastoid muscle. When the third fails to close, the opening is situated opposite the thyro-hyoid space, close to the sterno-mastoid. The fourth, when open, presents just above the sterno-clavicular junction. This is the more commonly persistent of the three. Internally or within the pharynx these clefts present in the following locations: The second in Rosenmuller's recess, between it and the tonsil; the third and fourth, into the blind canal, called by His the precervical sinus, these being intimately related with the development of the thymus body. Thus the thymus is tissue intimately related to the lymphoid which marks all obsolete passages, the tonsils themselves bearing a very close relation to the second cleft.

These branchial clefts present either as complete fistulæ, external culs-de-sac, internal ditto, or cystic dilatation of intermediate portions, both orifices being closed. It is now well established that certain pharyngeal diverticula are due to internal blind openings of these clefts. Watson (*Journ. of Anat. and Phys.*, vol. ix. p. 134) has described the most remarkable case on record of this general character. Sutton, moreover, has already made statement that certain of the so-called sebaceous cysts occasionally met with beneath the deep cervical fascia are in reality dermoids arising in persistent branchial remains and, consequently, analogous to dermoids of the tongue originating in the lingual canal. Harrison Allen has recently thrown much light upon the little masses of glandular or adenoid tissue situated in the fauces, by showing that they are the relics of the second branchial clefts, the pharyngeal tonsil, of course, marking the lower opening of the infundibulum. It might be well just here to digress for an instant to remark that lymphoid tissue thus located, no matter where, about the body, is always peculiarly prone to infection like other degenerated tissues, and that when infected it succumbs most easily to disease. This is conspicuous about the appendix, for instance, where it so frequently leads to disaster. It is commonly seen, moreover, about the tonsils and other tissues scattered about the pharynx.

I should add further in this connection that the congenital fistulæ occasionally met with in the middle line of the neck are

not to be confounded with branchial fistulæ, but are to be referred to persistent remains of the thyro-lingual or thyro-hyoid ducts. There is always a tendency when we start at the top of that which has been growing to credit the growth with the tendency to rise. To judge fairly, however, one should start at the bottom and begin by ascertaining how many other members of the group studied have taken other directions and partly or completely failed. The higher the place of an organism in the vegetable or animal scale the more restricted are the limits within which it is able to vary or to progress. As Coste has observed, few things are more instructive than the phenomena of blind alleys in evolution—that is, the evolution of certain growths along lines which stop abruptly, as if capacity for further development were wanting. Coste has followed out this line of reasoning in the vegetable kingdom in a very interesting way, but one which takes us too far from our present subject. (*New Science Review*, "Evolution and Teleology," July, 1895, p. 65.)

It often happens that the foliage proceeding from adventitious buds is very different from that of the rest of the plant. This is in accord with the theory of reversion, and these analogies are most common in the lower orders. Bud-formation is chiefly determined by nutritional conditions and implies always relative excess. That is, the forces resulting in growth are in excess of the forces antagonistic to it.

Even the dreaded tumors may be viewed from the same standpoint as a reversionary process. When animals are hard pressed for existence they appear to become more prolific. This is notably true in the human race, which seems to have the highest degree of fertility where the struggle for existence is the most arduous. In the case of the infectious granulomata, for instance, cells multiply in soil already impoverished, but show inherited weakness by their incapacity for prolonged existence. In the presence of a specific virus of any kind these tissue-cells show a disposition "to be fruitful and multiply," as Hutchinson says, "no matter what comes of it."

Thus reversion to earlier type in the avian and reptilian stage is remarkably shown in our liver-cells, where the tendency so often is to the elimination of nitrogenous materials in the form of uric acid rather than of urea. The wide bearing of this reversionary tendency upon the very common malady

known comprehensively as Bright's disease is apparent if we remember that the primary arterial lesions are, in all probability, due to the circulation in the blood of an uric-acid irritant, giving rise to the so-called arterio-capillary fibrosis. It is well known that among bipeds uric acid is eliminated by liver-cells without having undergone metamorphosis into urea, the urine of birds being solid instead of containing excretory material in watery solution. In fact, as Garrod says, "Our gouty patients are a sort of birds."

Certain nervous diseases possess characteristics justifying our regarding them as reversions to certain forms of activity normal in more or less remote ancestors. In the case of goitre, this has been practically established. It is curious, by the way, to note that goitre affects the lower animals almost always in those parts of the world where it is common in man. Horses are most liable; then dogs, calves and lambs. Cows and sheep are not so liable. Cystic goitre in various small animals, like squirrels, has also been reported.

But perhaps nowhere does reversion or atavism manifest itself more conspicuously or unmistakably than in the mutual convertibility of skin and mucous membrane. The former, being subjected to more modifying influences, of course undergoes more frequent changes. Thus, it furnishes in various animals hair, feathers, bristles, quills, horns, scales, etc.; and in the lower animals it furnishes glands which secrete mucus, milk, poisonous fluids, or fluids loaded with calcium salts, by whose deposition shells and even pearls are formed. Moreover, these characteristics are maintained in dermoid cysts found in these same animals. Thus in sheep they contain wool; in cats, hair; in pigs, bristles; and in birds, feathers. It is well known, moreover, that gray hairs are occasionally met with among the very young. So, also, in young subjects dermoids occasionally, but rarely, contain gray hair.

The mucous membrane has been called "the internal skin." In some respects this is more than a mere happy expression, because from this membrane may be developed many of those structures which we find in or upon the skin. Its most distinctive feature is its epithelial covering, which is ordinarily hypoblastic, but which blends in the buccal cavity, for example, with the infolding of epiblastic epithelium, whose papillæ calcify and form teeth, and from which in many animals there

develop hairy patches upon the inside of the cheek. Moreover, sebaceous glands are not confined to the skin, but are large and frequent ; *e. g.*, in the mucous membrane of the nymphæ. *Per contra*, mucous glands occur in the skin of reptiles, worms and fishes. Among the shell-fish the external glands secrete or produce the shell, while in reptiles and birds it is the glands in the oviduct which take on this shell-forming function, producing it rather for the egg than for the parent individual. We also know that calcareous formations are common in the human prostate as well as elsewhere. But it is not alone in those places where the epiblast and the hypoblast meet that such epidermal products are found. If skin and mucosa be really incontrovertible, why should we not look for hair in the alimentary canal? And if we do, we are not disappointed, because at least in certain birds there is a curious pyloric plug —filter, as it were—composed of hair. Garrod has shed much light upon the frequency of hairs growing from the mucous membrane. (*Collected Works*, p. 334.)

It is often seen that those structures ordinarily regarded as dermal are not at all necessarily so. Thus, the thick part lining the bird's gizzard is composed of epidermal cells, while pigment occurs in the mouths of many animals and in the vaginæ of many others. Calcareous deposits occur in the human prostate, in the oviducts of birds, reptiles and monotremes, and upon the outside of many of the invertebrates. Hair is seen in the stomachs of certain birds, upon the eyes and in the mouths of many animals ; mucous glands inside the alimentary canal of man, upon the skin of reptiles, fishes, and worms ; sebaceous glands ordinarily upon the dermal covering, but as well in the nymphæ of the human female. In the South are met certain blue-gum negroes, so-called because of the excessive deposition of pigment about the gum and palate. Here, too, we have a reversionary or atavistic manifestation.[1]

Thus, again, it will be seen that there is no one characteristic by which we can make a primary distinction between the skin and mucous membrane. Moreover, the old statement that the former is epiblastic and the latter hypoblastic will scarcely suffice, for certainly the conjunctival sac is a typical

[1] There is at least a superstition—how well founded I cannot say—that the bite of a "blue-gum nigger" is peculiarly infectious. This I learn from gentlemen who have practiced in the South.

mucous surface, yet equally certainly it is derived from the epiblast of which it occasionally shows some more active relic. The atavistic tendency is shown even further in the conversion that can be actually seen upon the surface of a long-extruded hemorrhoid, where the columnar epithelium of the hypoblast becomes metamorphosed into the scaly epithelium of the epiblast.

From all of which follows the corollary which Sutton has been quick to formulate, that a cyst lined with mucous membrane should be as readily admitted into the category of dermoids as one lined with skin, providing that either arise in situations where skin and mucous membrane do not ordinarily occur.

Let me next call your attention to the significance of polymastia, the so-called supernumerary and paramammary breasts and to the allied topic of gynecomastia. Aristotle refers to the yield of milk from male goats, and Blumenbach described a case in which the animal had to be milked every other day for a year. Isidore St. Hilaire kept for many years in the Jardin des Plantes a large-uddered he-goat that freely gave milk. It is well known also that among the Pomeranians and certain other people as well, the male breast yields milk very often.

Laycock, some years ago, made a suggestion that mammary-gland tissue may make its appearance upon almost any part of the human body. It is known to occur also in ovarian dermoids, while the occurrence of supernumerary breasts in such situations as the perineum would corroborate this statement, as well as the view that the mammæ are essentially nothing but specialized sebaceous glands that may be met, in normal or aberrant condition, in any portion of the skin. It is well known also that nipple-like processes are attached to the skin in many places, and that mammary tissue is found in locations unprovided with ducts. It is likely that this specialized tendency of sebaceous gland-tissue will account for the crops of furuncles which appear occasionally in the axillæ, especially in women, and most commonly about the menstrual period. This is certainly a manifestation of atavism, the atavistic side of it being shown by the abnormal presence of this tissue, while the furunculosis is, of course, to be explained entirely by accidental infection. In animals axillary mammæ are most exceptional, but they are met with in the fruit-bats and in the flying lemur.

Schultze finds that in multimastic animals the first mammary rudiment presents as a linear thickening of the epidermis along a line nearer the dorsal than the ventral surface, in which at various spots lenticular thickenings occur, between which the connecting strands disappear, and from which the individual glands are later developed. The domestic cow has normally four well developed and often two rudimentary teats. The latter may be occasionally so well developed as to yield milk. Other anomalies met with in the cow are disproportion in size of those normally present, or the placing of one or several supernumerary teats always behind the normal ones. In sheep the supernumerary teats are always placed in front of the normal ones. It occurs occasionally in the human species that a supernumerary nipple is placed in or near the middle line, either upon the thorax or the abdomen. This must be regarded as a distinct reversion to the marsupial type, since in the marsupial pouch three nipples are scattered along this line. Williams has done a great service by calling attention especially to the trefoil arrangement of the mammary gland in the human female, and to the important clinical fact that this arrangement is often overlooked by operators, who fail to dissect out during operations for cancer the ultimate portions of this trefoil arrangement, in which later recurrence may consequently more easily occur. The trefoil arrangement is practically a tendency to return to the polymastia of earlier days, and may be regarded as an atavistic polymastia.

But, passing from this interesting topic to a few practical illustrations of the bearing of evolution upon pathology, I must remind you that we often lose sight of the fact that there are changes in the human organism not so very much less striking than those which convert the tadpole into the frog. Aside from those to which I have already called your attention, we see instances in the teeth, the thymus, the breast, the uterus, the skeleton, etc., most of which indicate the possibilities of tissues remaining unchanged for long periods and then taking on new phases of growth by reversion to a state of embryonic activity. While in the ordinary course of organic evolution cells develop in regular and orderly manner in accordance with inherited tendencies, occasionally they arise at places where they have no business, or at inappropriate times, and then grow to an extent at variance with normal formation. In this way

are produced embryonic monsters, and malformations as well as various neoplasms.

Wisdom-teeth are to be regarded as reversions to a form of ancestors having a jaw long enough to contain more teeth, at least five or six molars. The extra incisors which appear at the edges of the premaxillary bone in extreme cases of harelip are also atavistic in character.

The well-known characteristic of so-called Pott's fracture of the fibula has been shown to be largely due to the fact that this bone is a rapidly disappearing relic, which, in fact, in many of the lower animals has already completely disappeared. In the human embryo at the third month the two bones of the leg are equal in size.

Of all the forms of club-foot, that known as equinovarus is the most common. It is the normal position of the foot in the embryo up to the seventh month, and in many of the quadrumana throughout their lives.

The acneal pustules which appear upon the face of adolescents at the period of puberty are, in effect, only atrophied hair-follicles or sebaceous glands endeavoring to produce the hirsute covering of our former ancestry.

It is of interest, also, to know that eczema is by no means confined to the human skin, but that it is one of the common heritages of nearly all living surface-tissues. Woods Hutchinson has shown that its oldest analogue is the exudation of gummy and resinous fluids upon the stems or leaves of plants and trees for the healing of wounds, and protection against fungi and entanglement of insect enemies. Quite analogous also is the outpour of protoplasm from the surface of an ameba, by which it encloses or attaches foreign bodies coming in contact with it. Among certain plants we find a disease which may be regarded as vegetable eczema, particularly in the so-called "apple-scab," which is caused by a distinct fungus (*fusicladium dendriticon*). In the course of this vegetable disease a distinct papular stage is seen, to be followed by an equally distinct horny stage, in which a layer of cork-like tissue is formed. Among tubers a similar disease known as the "potato-scab" is quite common. Among domestic animals mange in dogs, grease in horses, and foot-and-mouth disease in cattle are almost identical with eczema in the human subject, the irritant, however, being a parasite.

Moreover, as Hutchinson has shown, the preference which eczema seems to manifest for flexor surfaces, and especially flexures, is to be explained upon the principle that it is a dermatitis, and naturally occurs where skin is thinner and more delicate, while the irritating effect of perspiration, dust, heat, friction, etc., is more marked in these localities.

But all these facts to which I have called your attention tonight are more or less isolated instances from which great and important truths are yet to be deduced by those who have knowledge comprehensive enough to utilize them. Unfortunately, these men are as yet rare; and one remedy for this condition of affairs, which I place before you as deserving of most careful consideration, is the formation of a society in which should meet on common ground botanists, agriculturists, vegetable pathologists, biologists, zoölogists, veterinarians, and human pathologists, where all may exchange ideas, and where each may gain by contact with the others that which will add vastly to his own information and usefulness. Take the case even of the veterinarians, who practice earnestly and zealously and more and more intelligently in a field which, as one might say, is topographically next to ours. How much they know which might be of value to us, and how much we know which they could apply to the greatest possible advantage in their own work, did they but share the knowledge. It seems to me that the formation of some such society for the interchange of knowledge would be of the greatest imaginable help in the direction indicated.

The other essential, as it seems to me, is a carefully prepared work upon comparative pathology, in which should be recorded, collated, and carefully edited, the various facts known to the classes of students just enumerated. Such a work must necessarily be of composite character, since probably no man living knows enough in all these various branches to justify his attempting it as an individual task. Even the selection of an editor for such a work would be a difficult task and would be a high compliment to the man chosen. In the preparation of a book should be enlisted men like Hertig, who writes most entertainingly of the diseases of trees, and men of his stamp, who concern themselves mainly with the vegetable world. Others, again, like Metschnikoff, who have had a training as zoölogists, but who have the deeper insight which permits of

the application of their knowledge to the explanation of the problems of human pathology, should also be enlisted in this great cause. The ablest veterinarians of the world, and those who concern themselves with such problems, for instance, as are presented in this country to the Bureau of Animal Industry, should also contribute ; and, finally, their labors and results should be carefully collated and arranged alongside of the facts presented in our ordinary works on general pathology, and this last by an ideal editor, who should combine vast stores of general information with the knowledge of that which would enable this store-house of facts to be made available and applicable in the recognition and treatment of diseases in the human race. Thus, even the agricultural chemist, the botanist, and the naturalist might combine to produce a work whose value should so far exceed that of any single work now before our profession, as do our present books those published a hundred years ago upon the same subject.

This, then, is my plea to you in closing, that men in various branches of scientific work should get together and make common stock of their knowledge, and that the results of their investigations be presented to the scientific world in some such way as that indicated. There exist to-day no works in any language on comparative pathology. The ideal work to which my longing points would require two, three, or even more volumes,[1] and should be epitomized in condensed form, which could be placed in the hands of every second-year student, and upon which he should be fed, as it were, from the beginning of his second year until after his graduation, when the larger one should be in his hands until he has familiarized himself with its contents. When this happy condition of affairs is brought about, we shall have men in our profession who are liberally educated, shining in the light of a knowledge which, after all, would be focussed upon the problems of disease in man ; and, then, and I fear not until then, can medicine claim the title and privilege of being really liberal.

> There are great truths that pitch their shining tents
> Outside our walls, and though but dimly seen
> In the gray dawn, they will be manifest
> When the light widens into perfect day.
>
> LONGFELLOW (*Michael Angelo*).

[1] A new work of promising character in this direction is announced by Lubarsch and Ostertag (*Allg. Path. und Path. Anat. des Menschen und der Thiere.*)

TRANSLATION.

CHARBON.* (ANTHRAX).

SELECTED AND TRANSLATED BY ARTHUR S. WHEELER, V. M. D.

[Begun in May Number.]

On opening the thoracic cavity one notes the presence of a serous-colored exudate in the pleura and pericardium; the serous membranes are vascularized and ecchymotic.

The lung shows scattered congestive or hemorrhagic centres, due to bacterian emboli and to the rupture of obstructed capillaries. The bronchi contain a foamy mucus or a bloody froth. The myocardium is soft and appears cooked. The blood contained in the cavities and in the large vessels is black, pitchy and incompletely coagulated; the endocardium is dyed a deep red tint, due to the dissolved hemoglobin.

The nervous centres show congestion; stained serous exudates exist in the arachnoids and in the ventricles.

Besides these lesions, common to diverse forms, one encounters some accidental changes due to the local culture of the virus, which operates at the beginning or during the course of the infection.

The tumor has a bunch of glands for its centre; it evolves in the splanchnic cavities, or in the muscular masses of the body, and the superior regions of the limbs. Developed in the abdominal cavity, the tumor invades at once the wall of the intestine, the mesentery and glands; all those parts tumefied, gorged with uncoagulated blood, form a unique mass, friable and of a uniform dark color; the sublumbar or mesenteric glands, always altered at the same time, are often comprised in the tumor, from which they are differentiated with difficulty. The tumors occur much more rarely amid the mediastinal, bronchial and prethoracic glands. A localization quite frequently in the horse, and very commonly in the hog, takes place in the retropharyngeal glands; in this case death arises generally from asphyxiation before the disorganization of the tissues is complete.

One notes only a gelatinous edema, white or rosy, which distends the connective tissue and dissects all the organs. The tonsils and the lymphatics of that region are voluminous, infiltrated and hemorrhagic. The prethoracic glands, the inguinals, are sometimes the seat of analogous enlargements; the muscles comprised in the tumor form a mass of a color distinctly black, in every respect similar to a fragment of coal.

The surface tumors present, on section, a thickening of the skin, a gelatinous edema of the subcutaneous and intermuscular connective tissue, and a black coloration of the muscles comprised in the focus.

The histological study of the lesions shows that the bacteria are distributed in all the media. Examined in the fresh state, the blood has lost its normal appearance; the red corpuscles are confounded in irregular masses, in which the contour of the elements is no longer recognizable; in the free spaces the bacteria are seen in the form of rigid rods, immobile, colorless and very refractive, suspended in serum. The bacteria multiply in the parenchyma of the spleen, of the lymphatic glands, of the liver, and in general in all the tissues.

At points where the capillary circulation is very rich, the bacteria follow out all the vascular net-work, forming in certain localities complete emboli, penetrating, in others, into spaces scarcely permeable to hematoblasts. "On a section of a charbonous kidney, for example, stained by the simple method of Weigert, one sees under a low power, the glomerules and the intertubular capillaries traced out in blue with admirable distinctness, as if they had been penetrated by a successful injection.

Under a high power, one discovers that the capillaries are literally filled with bacteria; they show themselves under the form of blue darts; the bacterian injection of the capillaries is thus taken on the spot and can be studied in its minutest details. Nearly all the bacteria are contained in the capillaries, and it is only in spots that one encounters them wandering in the interior of the uriniferous tubules, especially the loops in the neighborhood of the glomeruli, where they have without doubt penetrated by way of the ruptured vessels. At the same time one is able to prove the integrity, almost absolute, of the epithelial covering of the uriniferous tubes, the cells of which are intact, with their nuclei coloring perfectly.

"On section of the spleen one sees the pulp and the vessels filled by a tuft of bacteria. The lungs present a repletion quite as great. The salivary glands, the pancreas and the mammary glands show still the same repletion of their subepithelial capillary net-work. The pictures furnished by sections of the mucous membranes are analagous; the richness of the intestinal villi in bacteria is excessive and gives the idea of a veritable injection. The omentum or mesentery also presents excellent objects of study. The skin, the brain, the muscles, the myocardium are relatively less rich in bacilli.

"There is one fact of which one may rest assured as to stained sections, that is that the bacteria collect by preference in the capillary meshes; the arterioles and venules contain them in much smaller numbers, without doubt by virtue of less adherence in the larger canals."—(Straus).

Diagnostic Symptoms.

(A) *Diagnosis on the Living Animal.*—The clinical diagnosis comports itself differently according to the species considered.

(*a*) *Charbon of the Horse.*—In the case of the regular acute evolution, the establishment of the grave general signs limits the differential diagnosis to a small number of diseases that have a rapid course. At the outstart the signs of colic and the bloody dejections cause one to suspect a lesion of the intestines, such as congestion, gangrene (invagination), or the rupture of the visceral walls. The permanent elevation of the temperature, the state of the mucous membranes enables one to establish a distinction. In some cases the course of subacute typhoid fever very nearly simulates charbon; the only different characteristic consists in the absence of colics, which often mark the beginning of charbon, and the appreciation of the metallic pitch of the beating of the heart in the latter affection.

Acute glanders is more nicely detected by the appearance of cutaneous edema and by the specific alterations of the pituitary membranes. Certain forms of *anasarca*, with a very rapid course, also simulate bacterian charbon up to the time of the eruption of the edematous spots; finally certain *intoxications*, notably arsenic poisoning (Bigoteau), provoking troubles, which

in the last period resemble very nearly those of charbon infection. In the types of slower evolution the diagnosis is difficult or impossible at the start. In charbon countries alone the vague symptoms observed will cause one to suspect the bacterian infection.

The accidents which give rise to external charbon are easily differentiated from bloody tumors of traumatic origin; they are distinguishable also from the cold and edematous engorgements of *traumatic gangrene.*

(*b*) *Charbon of the Bovida.*—The conditions of diagnosis vary with the type of evolution observed. In the superacute form the disease can only be confounded with a profound toxemia, and this cause is easily eliminated. In the case of the acute evolution the charbon, suspected after the suddenness of the invasion of the intensity of the general symptoms, is recognized from the fact that bloody evacuations appear. Symptomatic charbon does not present analogous characters, except in some cases with a very rapid course, and then the external tumors are wanting. The subacute forms remain often unrecognized; in regions habitually invaded only, will equivocal manifestations of the beginning make one always suspect the infection.

External charbon is more easily differentiated; the hot, painful and non-emphysematous tumors have a history different from those which characterize *symptomatic charbon.*

(B) *Diagnosis on the Cadaver.*—The autopsy often permits one to determine the diagnosis with a great deal of probability; the establishment of the bacteria in the blood makes it certain. The alteration of the blood is never wanting; if one establishes at the same time the tumefaction of the spleen, the hemorrhagic lesions of the intestines and the engorgement of the lymphatic glands, one will be able to conclude the presence of charbon with almost certainty. The presence of tumors in the horse and ox furnishes also valuable indications. The salmon-tint of the muscles, which permits one to suspect charbon, in the absence of the viscera, is wanting when the animal has been sacrificed before the ultimate period of the disease; in this case the coloration and the appearance of the muscles remain absolutely normal, at least for a certain time after death. It will always be easy to distinguish charbon bacteria immediately after the lesions are observed, and by the methods of experimental diagnosis.

In doubtful cases, bacterian charbon can be readily recognized if the autopsy is held shortly after death, either by seeking immediately for the bacteria in the blood and in the pulps of the organs, or by inoculating these same products.

The blood collected shows always the bacteria, easily detected under a power of 4-500 diameters, with or without staining. The products obtained by scraping the cut surface of the spleen, of the kidney, or the hypertrophied glands contain an abundance of the microorganisms.

A second way of control consists in the inoculation of a sheep, a rabbit, or a guinea-pig with the suspected products. One inoculates a cubic centimeter of blood derived from the heart, or a dilution of the pulp of the spleen or a gland, ground in boiling water. The inoculation is made preferably with a Pravaz syringe in the subcutaneous cellular tissues. The inoculated animals succumb in thirty or sixty hours ; they present at the point of inoculation a white gelatinous edema entirely different from the bloody edema consecutive to the infection by the septic vibrio ; the spleen is voluminous and soft ; there exist some congestion and capillary hemorrhages in most of the visceral organs ; the bladder is filled with a reddish or coffee-colored urine.

The indications furnished by these methods are less evident, according as the materials of proof are collected some time after death. In a few hours during summer, in eight or ten hours during winter, a large part of the cadaver of herbivora is invaded by the septic vibrio, and after that by numerous microbic species. The examination of the pulp shows multiple forms, of which certain ones resemble closely the bacteria ; under such conditions, an absolute conclusion is rarely permitted. Furthermore, the inoculation of the impure products is able to kill susceptible animals in a few hours, before charbon has had time to develop.

One will minimize the grave chances of errors in collecting the products for inoculation from the midst of the parenchymatous tissues (the spleen, kidneys), or better from the altered glands, which are remote from the abdominal cavity, which is the starting point of postmortem changes. In this case, one should employ preferably the sheep for making the test, because it is much less susceptible to accidental septicemia than the rabbit or guinea-pig ; if one of the last should be chosen,

they should practice, in the case of the guinea-pig, the subepidermic inoculation, or, in the rabbit the intravenous injection (vein of the ear), of the suspected liquid previously filtered. The surviving of the animals inoculated with impure liquids, is not sufficient for the diagnosis of charbon, the filamentous bacteria having perhaps been destroyed by putrefaction without producing spores; however, when the subjects succumb, one should necessarily establish in their blood the presence of bacteria, before formulating a diagnosis.

Finally the cultures on gelatin plates will even permit one to make a rapid diagnosis in doubtful cases; the colonies of the bacteria are easily distinguished in fact, from those which are due to other microbes.

Etiology—Experimental Study.

Virulent Matters.—In animals which have succumbed to charbon, the blood and all the tissues are virulent. The bacteria are diffused even in the various products of secretion; the nasal discharge is often contaminated as the result of hemorrhages at diverse points along the respiratory surfaces. The intestinal dejections are nearly always hemorrhagic and virulent; the urine is equally polluted in a number of cases.

The virulence of the milk is exceptional; Chambrelent and Moussoas have, however, found the bacteria in the milk of the guinea-pig and rabbit, and Nocard has encountered it in the milk of the cow. It is only after death, or in last stage of the disease that the bacteria appear; they are never very numerous.

Receptivity.—Among the conditions which are influential on the aptitude of the different organisms to infection, are either inherent in the species, or are the result of an idiosyncrasy of the individual.

(*a*) The influence of the species is very evident, and it is already established by the observed facts. The domestic herbivora, the horse, the ox, the sheep and goat, constitute the first group of animals possessing in a high degree a receptivity as regards charbon. It is impossible always to classify these species in the order of aptitude, by reason of the consideration of race which plays an important role. Horses, which in France and Central Europe are quite refractory to charbon, are stricken by preference in Sardinia, Russia and especially in

Russia. The bovida which are, in France, much less easily infected than the sheep, succumb more readily in Bavaria, Saxony and England.

This race influence suffices sometimes in endowing with immunity those animals which are specifically predisposed. Chauveau has shown that the Algerian sheep, of a pure Barbarine race, or crossed with the Syrian race of sheep with a large tail, were completely refractory to the natural infection and even resisted certain modes of experimental infection.

The hog is much less easily infected than the herbivora; until the last few years he was considered refractory, not only to accidental, but also to experimental charbon. The observations of Nocard and Villiau, Cornevin, Trombitas demonstrate the presence of accidental charbonous lesions, while the observations of Zschokke, Peuch and Crookshank establish the possibility of an experimental infection, and have established the conditions for it.

Carnivora show considerable resistance to the infection; however, accidental charbon is sometimes observed in the dog, cat and lion, and the artificial infection is equally realizable.

Among small animals, the rabbit, the guinea-pig and the mouse are extremely sensitive to the action of the bacterium.

The rat is equally susceptible to charbonous infection. The white rat, considered for a while refractory, shows itself much more resistant than the others, but it is nevertheless infected by diverse experimental procedures. Müller has shown that the chances of infection, represented by 1 for the white rats, will be expressed by 1¾ for white and black rats, by 2¾ for gray rats, and by 5½ for black rats.

The hen is completely refractory to natural contamination; its immunity cannot be overcome except by experimental processes. The pigeon and sparrow offer much less resistance. In certain cold-blooded animals, as reptiles and batrachians, infection can be obtained.

(*b*) Certain causes, inherent in the individual, modify the receptivity; among these, age possesses an evident influence. In a general way, young animals are much more easily contaminated than adults, and these variations are easily demonstrated in those species which fall upon the border of receptivity. G. Colin has established that birds recently hatched are easily infected. Peuch and Crookshank have seen

young pigs succumb much more often than adults to experimental charbon. The young dog is also more apt to infection (Peuch). The young white rat is killed, whereas the adult nearly always resists.

The resistance of organisms is almost always able to be overcome by the diverse manipulations of experimentation. The immunity inherent in a species, the most stubborn of all, is surmounted in the chicken, if one lowers the temperature a few degrees by partial immersion in cold water (Pasteur). The frog is contaminated if one raises the temperature by placing the animal in water at 35 degrees (Gibier). Extirpation of the spleen of the dog (Bardach), fasting in the pigeon and hen (Canolis and Morpugo), augments considerably their receptivity. The privation of water acts in the same sense ; Pernice and Alessi have obtained by this method the evolution of charbon in the dog, the hen, the pigeon and frog. The bloody emissions have a predisposing action, analagous to that of the rabbit (Rodet). The disturbance diminishes at that point the resistance of the white rat, in which it permits infection eleven times out of thirteen.

The resistance proper to certain races is still less impregnable. The Algerian sheep, refractory to natural infection, are affected in a certain proportion pursuant to repeated inoculations of charbonous virus ; the mortality augments with the quantity and quality of the virus injected (Chauveau).

A degree of resistance, more or less absolute, but always very appreciable, is conferred by the first contact of the disease. It is probably due to a vaccination by a previous infection, localized or slight, that certain animals belonging to the races and species the most predisposed owe their immunity to certain modes of natural infection.

REPORTS OF CASES.

TWO CASES OF PERSISTENT HYMEN.

By George N. Kinnell,
Pittsfield, Mass.

Case I.—An aged roadster mare of no particular breed was stinted to a French coach horse, Prince d'Or. On attempting copulation, the penis would not penetrate more than a few inches when the mare would commence cringing more than they ordinarily do, and the stallion screaming would rear up and dismount. Manual examination revealed a persistent hymen in the form of a strong fibrous cord. Dilatation of the vulva with the hands and moderate traction on the cord, readily brought it into view, when it was seen to consist of white fibrous tissue, about two and a half inches long and running transversely across the genital passage. At its central part it was rope-like, about as thick as a man's thumb, and very tough and hard. Toward each extremity it became flattened out antero-posteriorly, taking on the character of a thick, tough membrane, and was firmly attached to each side of the vagina.

Case II.—A three-year-old cow at her first parturition. Animal had been in labor for twelve hours, rectum protruding, vulva apparently much swollen, the enlargement having a pronounced conical shape, two feet projecting a few inches from the orifice. Attendants had pulled repeatedly on the projecting members but without any effect, other than to cause the patient distress. Exploration with the hand discovered the calf's nose and face wedged firmly against the roof of the vagina, while tight under its jaws was a hymen answering in all essential features to case number one.

In both cases dilatation and retraction of the labiæ of the vulva, with slight traction on the hymen, readily brought it within sight and reach.

Section with an ordinary bistoury was all the treatment adopted or required.

Note to Case II.—The feet and head were returned to the womb before section of the hymen was attempted, immediately after which the cow delivered herself of a live calf. Twenty minutes later on giving the usual parting glance it was discovered that the cow had laid down, commenced straining and had everted the entire body of the womb. The organ was quickly returned to its place, the vulva secured by three deep sutures and the animal banked up in the ordinary way. She made a speedy and complete recovery.

A LITTLE EXPERIENCE WITH BARIUM CHLORIDE IN COLIC.

Having read many articles on the value of this agent in producing quickly evacuations of the bowels in colic, I accordingly purchased a pound of the chemically pure article and was then of course glad to have an opportunity to try it. The opportunity came on the evening of February 24, when I was called to a compactly-built work-mare suffering with flatulent colic. She was very tympanitic and had been in pain for some hours. I at once tapped her with trocar, and then administered ninety grains of barium chloride in an ounce of water with a little cannabis indica. The mare was very restless and rather lymphatic in temperament and heavy-headed, consequently I was unable to keep her head elevated sufficiently long to prevent losing a little of the medicine, probably one-half. In about twenty minutes I gave ninety grains more in an ounce of water. The stable was small and there was no opportunity to "exercise" her, and she was allowed to be quiet. It was not long after the second dose when I noticed the peristalsis quite loud and active, and soon she began to elevate the tail and pass considerable wind and a little slimy substance from the bowels, but no solid excrement. The pain did not seem increased, and finally when I left her she seemed to be fairly quiet, pulse good, belching considerably, and very dull and stupid. Next morning I saw her again, when she was free from pain but very dull and no appetite. I saw her again in the afternoon and she seemed to be all right and eating.

No. 2. March 11, 6 p. m., I was called again to the same stable to see a rather well-bred, aged gelding suffering from colic but without tympany; he was very restless although he had had about two drams fluid extract cannabis indica before I got there. I gave him ninety grains barium chloride in an ounce of water, together with four drams fluid extract cannabis indica. I then left a little more cannabis indica to be given in twenty minutes if not easier, and I went home to get supper and returned in about an hour to him. I found the horse no better, but rather more uneasy and no passages. I then gave him ninety grains more in same quantity of water and half ounce cannabis indica. Animal was very restless, and there were no movements of bowels and little peristalsis. We kept on with the cannabis indica to relieve the pain if possible, and pushed it heavily so that he got four fluid ounces in about six hours. He began to have passages in about three hours, and had three or four passages in a few hours, not very copious but about half the normal amount. He suffered intensely all night, with great sweating about head and ears, and I began to fear a calculus or some obstruction (my first diagnosis was impaction). I neglected to say this horse had been standing in and not worked on the day of the attack.

The animal was much worse when I left him at midnight than when I first saw him. Next morning I saw him again, and he was down and completely helpless; the owner said the animal had had copious and numerous movements of the bowels. I thought that probably he was exhausted from pain and possibly the effect of the medicine, as I had seen mentioned partial paralysis lasting for a short while, so I told the owner to let him rest and I would try slinging him by noon. When I arrived at noon the knacker was loading him and the owner said he died at 10 a. m.

At the autopsy no calculus, twist or any other obstruction was found; the bowels were entirely empty of solid contents, a little bluish in color, the heart very much enlarged and very friable. No other serious lesions.

Now, the question that presents itself to my mind is—What killed that horse? It was certainly not an overdose of barium chloride, for M. J. Tracy, in February number of the MAGAZINE, gave that as a regular dose and even doubled it at times.

I cannot but think from my observation of the case that the barium chloride was the cause of death, for the animal rapidly became worse after administration of the drug, and the cannabis indica was not sufficient to control the pain produced. I have had one or two cases of colic in which I have had to administer four ounces of fluid extract cannabis indica before the animal came under the influence and recovered, but I never had a case of colic die with cannabis indica that I can remember, without some hopeless complication, such as volvulus, calculus, rupture, etc. I have given ninety-grain doses of barium chloride in two other cases, but never heard of there being any result.

I have written this paper to show my experience. On the other side of this case we have had the good side shown up plentifully and strong. I must say, till I see better results, I must feel pretty shy of this drug, for I notice in the articles published that a number of cases did not recover from the effect of the *increased pain* produced for three or four hours. With cannabis indica alone and a trocar, it is a bad case that lasts an hour or over, and I can tell you that I don't care to watch a case three or four hours when by other means I can get through in thirty to forty minutes. I have written this article in order to provoke, if possible, argument and criticism, and hope that possibly some of the advocates of the drug may tell me wherein I have erred in not being used to the drug, and that they may give proof that it is the drug par excellence for colic.

STATE BOARD OF VETERINARY EXAMINERS IN VIRGINIA.

The Virginia State Legislature recently passed a law creating a State Veterinary Board. It would seem that the tendency for the creation of such Boards is spreading, and it is, probably, only a question of time when most of the several States will have passed into line. Let the good work proceed, but let such Boards fall only into the most capable hands.

ABSTRACTS.

DEFORMITY OF THE CRANIUM IN EPILEPSY.

Bassi observed, in 1891, an asymmetry in the cranium of horses affected with true epilepsy. In the same year, Trinchera published some clinical cases confirming this view, and in 1894, related eight new cases of essential epilepsy in horses whose cranium did not have the same form on both sides. Of seventeen cases, the asymmetry was found in thirteen geldings, two stallions and two mares. In about two-thirds of the cases, the right side of the cranium, and especially the region of the parietal bone, was depressed.—*Rec. de Méd. Vét.*

PATHOGENESIS OF PARTURIENT FEVER.

No microbic organisms have been cultivated from the internal organs—liver, spleen, kidney, nerve centres. From the material expressed from the mucous membrane of the uterus of cows that were destroyed by this disease, Nocard succeeded in obtaining microbic cultures from all the specimens inoculated. These cultures included a number of species, but most frequently staphylococcus predominated, and in two instances it was the only one found. According to the author, this microbe plays the most important part in the pathology of parturient fever, and, proliferating in the thickness of the uterine mucous membrane, acts upon the various organs by the diffusion of toxic products elaborated.

The elimination of these products through the various excretory organs whose functions become re-established, explains the rapid disappearance of the symptoms in certain cases.—*Jour. de Méd. Vét. et de Zoötechnie.*

SECTION OF THE NUCHAL LIGAMENT IN FISTULA OF THE POLL.

In cases of fistulous suppuration of the tissue of the poll with diffuse swelling and infiltration of the surrounding muscles, Peach recommends section of the ligamentum nuchae. This,

according to him, prevents the compression of the subjacent tissues, and places them in a better condition to eliminate the necrosed parts. The section is made at the most dependent part of the fistulous tract. The author speaks very highly of the success which the operation has given him.

Operation.—A flat, straight tenotome is introduced into one of the fistulous tracts; its edge is turned toward the cord of the ligament, and the head being maintained in extension, the latter is cut across from within to without, being careful to avoid incising the spine. Excessive hemorrhage is arrested by an oakum packing.

He also speaks well of the use, in fistula of this region, of equal parts of naphthol and camphor.

A FRAUD IN MILK.

Four samples of milk, stated to have been supplied by a certain dairy, were sent to this station, in June, 1895. They were tested with the following results:

	A.	B.	C.	D.
Specific gravity	1.032	1.030	1.033	1.029
Solids, per cent	11.09	10.47	11.36	9.68
Fat, per cent	2.20	2.25	2.70	2.20
Solids not fat, per cent . .	8.89	8.22	8.66	7.48

The solids are below the normal average by 1 to 3 per cent and the fat is too little by more than 1 per cent. These facts indicate removal of fat and addition of water; but the specific gravity is that of normal milk. Such exceptional milk might be the product of a single cow, perhaps, but that any herd of healthy animals can give such milk is contrary to all recorded experience.

The sender was advised to witness the milking of the herd and to send for analysis another fully authenticated sample.

Two days later we received two samples with the message: "These two bottles were filled at the barn by a man who saw the whole process. He says he is sure there is no water in it." Examination of these samples gave the following results:

	A.	B.
Specific gravity	1.0325	1.033
Solids, per cent	11.00	11.29
Fat, per cent	2.60	2.65
Solids not fat, per cent	8.40	8.64

We wrote, asking for the name and address of the witness present at the milking that we might get from him further particulars and an affidavit. In reply we were informed that the witness had since mentioned that "when the cows were about half milked, the calves were turned in to feed and finish the milking!"

The quality of these samples of "milk" is quite what would be expected under such circumstances.

It is well known that the portions of milk first drawn from the udder are watery and poor in fat and other solids, while the last portions are rich in solids and fat. The following figures by Bouchardat and Quevenne* illustrate the extent of this difference. The milk of three cows, I, II and III, which gave 20, 14 and 20 litres (quarts†) respectively, was examined with results as follows:

			Per cent.			
		Sp. Gr.	Water.	Fat.	Casein.	Sugar.	Total Solids.
I.	First litre . . .	1.034	89.51	1.40	3.87	5.18	10.45
	Last litre . . .	1.026	83.82	7.37	4.09	4.72	16.18
II.	First half . . .	1.034	88.47	1.79	4 12	5 62	11.53
	Last half . . .	1.031	86.61	4.36	3 96	5.07	11.39
III.	First litre . . .	1.031	89.81	0.85	3.64	5.70	10.19
	Last litre . . .	1.027	84.95	6.39	3.35	5.31	15.05

Harrington (Report of Massachusetts Board of Health for 1889, p. 189)* found in milk of a Jersey cow:

	Per cent.		
	Water.	Fat.	Total Solids.
In "fore milk"	86.66	3.88	13.34
In "middle milk"	84.60	6.74	15.40
In "strippings"	82.87	8.12	17.13

Allowing calves to take a part of the milk is a common and, in itself, proper practice; but any one who sells the first of the milking as whole milk, grossly defrauds the purchaser. This case is interesting in calling attention to a possible dishonesty which is not always fully and certainly met by legislation.

E. H. JENKINS.

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* Quoted from "Zusammensetzung und Verdaulichkeit der Futtermittel," von Dietrich und König, pp. 837, 838.

† 100 litres equal 105 quarts.

COMMENCEMENT EXERCISES.

COMMENCEMENT EXERCISES OF THE VETERINARY DEPARTMENT, McGILL UNIVERSITY.

The annual public meeting of Convocation for the conferring of degrees in Comparative Medicine and Veterinary Science was held March 27, in the William Molson Hall, McGill University. The proceedings were not marked by the usual playful demonstrations indulged in by students on occasions of this kind.

Mr. J. R. Molson presided, and among the governors present were, including Principal Peterson and Sir William Dawson, Professor Clarke Murray, Mr. S. Finley, Dr. W. I. Shaw, Mr. Justice Davidson, Mr. Justice Archibald, Dr. Craik, Dean of the Medical faculty; Professors Wesley Mills, Girdwood, Principal McEachran, Dean of the Faculty of Comparative Medicine and Veterinary Science; Dr. Charles McEachran, Professors Baker, Penhallow and Adami, Mr. J. Fleet, Dr. Deeks, Dr. Marrow, Dr. Johnson, Dr. Ruttan, Dr. Martin, Mr. W. C. McDonald, Rev. J. Clarke Murray, Mr. C. J. Gould, Drs. A. W. Clement, of Baltimore, and J. M. Parker, of Haverhill, Mass. Prof. Murray opened the Convention with prayer.

Graduates and Prize Winners.

Principal McEachran read the report of the sessions of 1895 to 1896. The session opened on the 24th of September, and was continued until March 25. The number of students who registered was 41. Of these, 38 attended the full course, viz., from the United States, 14; Canada, 20; England, 4. He then read the list of those who had passed the examinations in the order of merit as follows:

Graduating Class.

Jas. E. Craik, Harri H. Dell, John Greer, Charles H. Higgins, Fred. W. Kee, Samuel Macnider, John J. McCarry, Edward H. Morris, John A. Ness, Samuel C. Richards and Ernest C. Thurston.

The list of prize winners is as follows: Veterinary Medicine and Science, H. H. Dell; Anatomy, R. G. Matthew; Cattle Pathology, H. H. Dell; Cynology, H. H. Dell; Pharmacology and Therapeutics, H. H. Dell; Botany, W. B. Wallis; Chemistry, B. B. Killam; Physiology, B. A. Sugden. For the best general examination in all subjects, silver medal, H. H. Dell.

Extra prizes were also awarded as follows:

For the best essay read before the Veterinary Medical Association: (1) H. H. Dell. Second and third prizes are added together and divided between Messrs. Kee, Higgins and Ness.

For the best essay read before the Society for the Study of Comparative Psychology: (1) R. G. Matthew; (2) H. H. Dell; (3) F. W. Kee. The first-year prize was won by J. P. Spanton.

Professor Adami's prize of $50 for Original Pathological Research, open to students in the final years in Human and Comparative Medicine. Divided between C. H. Higgins, B. Sc., Comp. Med., and Mr. R. H. Martin, Human Med., Mr. Higgins' work being on an epizootic of chicken cholera near Montreal.

Acting-Secretary Brakenridge then administered the oath to the graduating class, and was followed by Principal Peterson, who performed the interesting ceremony of "capping."

Professor Wesley Mills delivered an instructive address, reviewing the duties and the scope of the work of the veterinarian.

CHICAGO VETERINARY COLLEGE.

On March 24, the thirteenth annual commencement exercises of the Chicago Veterinary College were held in the College Auditorium. On the evening previous a banquet was tendered by the trustees to the faculty and graduating class at the Sherman House, and a most enjoyable evening was spent. The week preceding the date of the graduating exercises was taken up by the final examinations, the results of which were that twenty-eight students passed. Of this number eight passed in honors. Dr. E. J. Davidson received the gold medal of the college for the highest general average. Dr. Davidson also received the prize for the highest standing in theory and practice. Dr. E. Jentzsch won the prize for the best standing in anatomy, and Dr. Walter Bolton the prize for the best examination in chemistry.

On the evening of the commencement exercises, a large audience assembled in the auditorium of the college building. The lecture room was tastefully decorated for the occasion, and many beautiful floral tributes were brought by admirers of the

successful students. The chair was occupied by Dr. A. H. Baker. The other members of the faculty occupying the rostrum were Joseph Hughes, M. R. C. V. S.; Finley Ellingwood, M. D.; C. E. Sayre, M. D, D. V. S.; J. F. Ryan, M. D. C.; A. R. Edwards, M. D.; George S. Baker, D. V. S.; E. L. Quitman, M. D. C.; M. R. Trumbower, D. V. S., and A. S. Alexander, V. S.

Among the visiting veterinarians who occupied seats on the platform were Drs. Olaf Schwartzkopf, C. A. White, A. McBride, F. S. Lambert, A. Savage, N. G. Bailey, etc., etc. The chairman commenced the proceedings by reviewing at length the progress of the institution since its organization in 1883, and in the course of his address stated, that this was a most fitting time to announce that henceforth the college course would be extended from two to three sessions, covering three years instead of two, as heretofore. He wished at the same time to make the statement that the Chicago Veterinary College eight years ago was the first of the two-year schools to agitate the question of extending the course to three years. At that time this school corresponded on this subject with some of the most prominent of the older two-year schools, but our communications were, with one exception, entirely ignored, and even in the case of the exception the proposition was declared premature. Having congratulated the members of the graduating class on their successful completion of the course, he conferred on each member the degree of Doctor of Comparative Medicine, and presented the diplomas. The class valedictorian, Dr. A. C. Worms, then delivered his address, and was followed by Dr. A. S. Alexander on behalf of the faculty. Dr. E. R. Flack delivered the class prophecy. Dr. Schwartzkopf then addressed the faculty and graduates, and in doing so he highly complimented them on the change from a two to a three-session course. He predicted that it would materially add to the prestige which the Chicago Veterinary College already had.

The following is the list of graduates and their present location : W. Bolton, Waukesha, Wis.; R. L. Brown, Janesville, Wis.; C. E. Brownback, Pleasant Plains, Ill.; O. F. Butterfield, Leithton, Ill.; E. J. Davidson, Grand Forks, N. D.; Edwin Dickinson, Fayette, Iowa ; G. K. Dodson, Los Angeles, Cal.; F. A. Dolton, Dolton, Ill.; Henry F. Eckert, Reeseville, Wis.; E. R. Flack, Milwaukee, Wis.; J. W. Foster, Lafayette, Ind.; D. J. Hallon, Hortonville, Wis.; E. M. Herrin, Highland, Ill.; J. G. Hope, Chicago, Ill.; E. Jentzsch, Chicago, Ill.; E. A. Johnson, Platteville, Wis.; M. H. Kyle, Highland, Ill.; N. W. Kyle, Colfax, Ill.; J. A. McGarry, Milwaukee, Wis.; W. J. Malone, Springdale, Wis.; F. McCoy, Lake Odessa, Mich.; C. G. Nelson, Chicago, Ill.; J. H. Pear, Chicago, Ill.; F. R. Pierce, Dows, Iowa; F. P. Scott, Petersburg, Ill.; William Voss, Kiel, Wis.; C. H. Whitwell, Dubuque, Iowa; A. C. Worms, Chicago, Ill.

PROCEEDINGS OF SOCIETIES.

MASSACHUSETTS VETERINARY ASSOCIATION.

The regular meeting of the Massachusetts Veterinary Association was held at 19 Boylston Place, Wednesday, February 26, at 8 p. m. Dr. Parker, the president, in the chair.

The following members were present: Drs. Beckett, Blackwood, Bunker, Burr, Cronan, Emerson, Hamilton, Lewis, LaBaw, Osgood, Parker, Pierce, Rogers, Sheldon, Winslow, Winchester and McLaughlin. Honorary member, Dr. Stickney.

Minutes of last meeting were read and accepted after Dr. Burr had corrected his statement in regard to tuberculin, having it read "good" instead of "reliable."

The secretary called the attention of the Association to the fact that the elections of Drs. Frothingham and Cannon were illegal, not having been before the Association the length of time prescribed by the constitution. Dr. Osgood then moved that we again ballot on these names; carried; and they were unanimously elected.

Cases reported:

Dr. Pierce reported case of mare six weeks in foal having dizzy spells when first starting on a drive; would have only one attack. After removing overdraw check from harness there was no more trouble.

Dr. McLaughlin reports interesting case, as history is well known. Cow calved and cleaned all right a little over a year ago, following which she had a number of attacks of supposed indigestion. Last calf came two weeks before time and dead. Inside of one week showed dropsy of legs and abdomen. Diagnosed, foreign body in heart. Autopsy showed wire three inches long through right auricle at apex. Abscess at point of entrance of wire.

Dr. Burr saw in a post-mortem case the track of a wire from the second stomach to the pericardium; fluid and the wire in the pericardial sack.

Dr. Emerson saw a cow that had been fed on lawn grass. Had a number of attacks of supposed indigestion, but finally died, and a nail was found in the pericardium.

Dr. Beckett had a large horse with peculiar, sudden lameness; would point and rest on outer toe. No soreness in foot or at any point. Diagnosed, possible paralysis.

Dr. Burr reported similar case that Dr. Bryden had.

Dr. LaBaw had similar case. Horse had been cast. On attempting to rise failed. Rolled him over and he got up, but was unable to support body on that leg.

Drs. Bunker and Parker reported undesirable effect from calomel. Swelling of lips, tongue, and profuse salivation. HOWARD P. ROGERS, *Secretary.*

The thirteenth annual meeting of the Massachusetts Veterinary Association was held at Young's Hotel, Boston, April 22, 1896.

The only business of importance was the election of officers, with the following result: President, Dr. John M. Parker, Haverhill; first vice-president, Dr. Madison Bunker, Newton; second vice-president, Dr. Daniel Emerson. Lynn; secretary and treasurer, Dr. Howard P. Rogers, Allston. Executive Committee, Dr.

Thomas Blackwood, Boston; Dr. William E. Peterson, Waltham; Dr. Henry Lewis, Chelsea; Dr. J. R. McLaughlin, Newton; Dr. George Lee, Brighton.

After the business was completed the members adjourned to the banquet hall. As there were no guests present the after-dinner exercises were very informal.

HOWARD P. ROGERS, *Secretary.*

NEW HAMPSHIRE VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the New Hampshire Veterinary Medical Association convened in the Eagle Hotel, Concord, Tuesday, May 5, at 11 a. m., with vice-president, Dr. Hart, in the chair.

Drs. Hart, Maguire, Lilico, Abbott, Wilkinson and Pope answered to roll call. The following officers were elected by ballot for the ensuing year: President, T. G. Lilico, M. R. C. V. S.; vice-president, F. E. Wilkinson, D. V. S.; secretary and treasurer, L. Pope, Jr., M. D. V.

Following the election of officers discussion ensued over the action taken by Dr. Geo. Bailey of the Maine Cattle Commission against New Hampshire Veterinarians.

The secretary was instructed to notify the Massachusetts Cattle Commission of non-qualified men making tests with tuberculin now acceptable to that board.

A paper was read by Dr. Abbott on Homeopathy in Veterinary Medicine which was most excellent in its preparation and delivery. Discussion following showed a strong feeling against the new school.

The reports of secretary and treasurer were read and acccepted.

The meeting adjourned at 1 p. m. until the September meeting.

L. POPE, Jr., M. D., *Secretary.*

CONNECTICUT VETERINARY SOCIETY.

The following officers were elected at the annual meeting of the Connecticut Veterinary Society, held at the office of Dr. Thomas Bland, at Waterbury, on the evening of June 2, 1896: President, Dr. Harrison Whitney, New Haven; first vice-president, Dr. E. R. Storrs, Willimantic; second vice-president, Dr. R. P. Lyman, Hartford; secretary, Dr. H. W. Eliot, Ansonia; treasurer, Dr. J. P. Kelley, New Haven. Board of Censors, Dr. J. E. Gardner, Hartford; Dr. R. P. Lyman, Hartford; Dr. Thomas Bland, Waterbury; Dr. M. Isaacs, New Haven, and Dr. R. D. Martin, Bridgeport.

Applications for membership were received from Drs. P. T. Keeley and E. P. McKenna.

Dr. Bland gave a report of an operation on a mucous cyst, situated at the base of the tongue. The cyst increased in size till it forced the epiglottis back into the opening of the larynx, so the horse was unable to breathe except through a tracheal tube. As soon as the cyst was opened the horse was able to breathe in a natural way.

The next meeting will be held in Hartford, Conn.

H. W. ELIOT, *Secretary.*

SCHUYLKILL VALLEY VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting was held on Wednesday, March 18, 1896, in the room of Common Council, City Hall, Reading. It was called to order at 1 p. m. by President Burkholder. Dr. Noack acted as Recording Secretary. At roll-call the following members responded: Drs. Burkholder, Sallade, McCarthy, Noack, Fegley, Kershner, Brackbill. The minutes of the last meeting were read and approved.

The committee on legislation reported as to the communication which should be brought before the City Council and discussed its being carried into effect. Dr. Sallade, of the Board of Examiners, reported a case in which he was asked by an attorney about the registration of a man who was for ten years practicing but did not know the law and consequently did not register. The association instructed Dr. Sallade to answer in the negative.

On request of Dr. Sallade for support to the Board of Examiners, Dr. McCarthy made a motion that an assessment shall be made for the prosecution of illegal practitioners as far as the interests of the members of the association are concerned. The motion was seconded and carried.

Dr. Noack's motion that he should be authorized to write to the Governer for the reappointment of Dr. Sallade on the Board of Examiners was carried. A resolution was offered that the words in the By-laws "existing practitioners" in application for membership be stricken out. It must be brought up at the next meeting, because any change of the By-laws has to be made in writing by two members at the next meeting.

The president called upon Dr. Brackbill to read his paper on "Spavin," which was ably discussed as to the different modes of treatment. In the absence of Dr. Noack, a translation from the *Revue Vétérinaire* on "Inoculation of Tuberculosis of the Gallinæ in the Mammifers," was read by Dr. Fegley. "The General Pathology of the Lymphatic System" was the subject of the paper read by Dr. McCarthy. Program for next meeting: Bieber, Mange; Moyer, Castration Faughman, Tetanus; Sallade, Social Position of the Veterinarian; Noack, Emphysema. Moved to adjourn at 5.30 p. m. and meet at Pottsville, June 17.

OTTO NOACK, *Corr. Secretary.*

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The May meeting of the Keystone Veterinary Medical Association was called at 8.30 on the evening of the 12th inst. by President J. R. Hart, with the following present: Drs. F. S. Allen, H. A. Hackley, J. R. Hart, Chas. Lintz, W. H. Hoskins, H. J. McClellan and W. L. Rhoads.

Dr. Hoskins as chairman of the committee appointed to look up the question of cost, etc., of certificates made a very favorable report, and on motion of Dr. Chas. Lintz the committee were instructed to procure a number of certificates before the next meeting, at which time they will be given to all members in good standing.

Dr. Hoskins by request made a report as a member of the State Board of Veterinary Medical Examiners, stating that there were out of fourteen applicants, but three passed at the recent examination.

The examination papers throughout showed that a good primary education is essential to the veterinary student and he urged that all schools be more careful in the examinations of their matriculates if they would graduate men who would be an honor to their Alma Mater.

The next examination held by the board will be June 15 and 16. After July 1, 1896, every applicant for examination must come from a three-year school.

It is to be regretted that a number of the schools seem to be ignoring this fact.

The society unanimously gave Professors Brenton and McEachran much credit for the position they had taken in refusing to longer remain with a school having less than a three-year course.

It was now moved and seconded that an order be drawn for the payment of the rent for the full session. This being voted upon and the secretary instructed to pay the same, Dr. Lintz moved that, as a finis to one of the most successful, pleasant and progressive years in the history of the association, after the transaction of business at the next meeting, we have a lunch. This was unanimously voted upon, an evidence that the Keystone Veterinary Medical Association members enjoy a physical as well as an intellectual feast.

The president now appointed Drs. Chas. Lintz, F. S. Allen and W. H. Hoskins to attend to this matter.

Dr. Rhoads, reading some extracts from medical journals deriding the germ theory, caused the followers of Pasteur to grow quite enthusiastic.

After the report of a complicated case by Dr. H. J. McClellan the meeting adjourned to meet June 9, 1896.

W. L. RHOADS, *Secretary.*

The April meeting of the Keystone Veterinary Medical Association was called to order on the evening of the 14th at 8.30 by President John R. Hart with the following members present: Drs. John R. Hart, W. H. Hoskins, H. P. Eves, Chas. Lintz, Jas. T. McAnulty, F. S. Allen and W. L. Rhoads. After a report of the work done by the State Board of Veterinary Medical Examiners, Dr. Hoskins by request made a report as a member of the committee appointed by the Mayor to select a consulting veterinarian for the city meat and milk inspectors.

Dr. F. S. Allen was now unanimously elected to membership.

The question of society certificates was agitated and, after a short discussion, Drs. Hoskins and Rhoads were appointed by the president to report at the next meeting as to cost, etc.

Dr. Chas. Lintz being essayist for the evening read a very interesting paper on "Pleurisy, Acute and Chronic," in which he spoke of several very interesting points in the causes, symptoms, complications, sequellae and remedies ordinarily used, also those he found most beneficial, viz.: In the first stage (which the practitioner seldom sees unless favorably near at hand) he advocates the use of mustard to the sides and sternum, also

℞ Quinine . . . . . ℥iv.
Tereb . . . . . .
Acacia Pulv aa . . . . . ℥vi to ℥iss.
Giving ℥i at dose.

Second stage, do away with mustard and alternate with Soda Salic. every two hours. After five or seven days give Soda or Potassium.

This paper aroused an earnest discussion, some advocating the use of most powerful heart stimulants, Nitro-Glycerine and Nux vomica, claiming Digitalis was not to be relied upon.

Dr. Hoskins cited case of brown driving mare eight years old, weight, 1045 lbs., which at times appeared dull and had a peculiar tossing of the head, profuse sweating and at this time incoordination of movement. Diag. Cerebral Anemia.

Meeting adjourned to reconvene May 12, 1896.

W. L. RHOADS, *Secretary.*

PHILADELPHIA SOCIETY OF VETERINARY MEDICINE.

The regular monthly meeting of the Philadelphia Society of Veterinary Medicine was held in the lecture room of the Department of Veterinary Medicine of the University of Pennsylvania, on Wednesday evening, February 19, 1896. The president, Dr. M. E. Conard, called the meeting to order at 8.30 o'clock. The minutes of the January meeting were read and approved. The board of censors, appointed to act on the application of Dr. Walter G. Dilkes, of Barnsboro, N. J., for membership, reported favorably and Dr. Dilkes was elected a member of the society. Dr. Harger moved to instruct the secretary to write to veterinarians in and around Philadelphia, pointing out the advantages of belonging to a good society, telling them of the work we are doing and what we have laid out for the near future, thereby securing their co-operation and increasing our membership. Dr. Williams suggested the advisability of holding the meetings in a hall more centrally located; after considerable discussion it was decided to continue, for the present at least, to hold the meetings of the society at the Veterinary Department of the University of Pennsylvania, inasmuch as, through the courtesy of the department, we have every convenience offered us free of all cash. It was moved and passed to have 250 blank applications for membership and 250 circulars to send to veterinarians, printed. Dr. Ridge moved to appoint a committee of three to draft a constitution and set of by-laws, carried. Upon written request Dr. F. S. Allen's name was ordered to be stricken from the roll of membership.

Dr. Muir then read a paper on "Veterinary Representation in the National Convention of 1900 for Revising the Pharmacopeia," which was briefly discussed by Drs. Harger, Williams and Conard. Dr. Eves reported two cases of pleuro-pneumonia in steers near Wilmington, Del. Discussion on the diagnosis of the disease, the care and sanitary condition of the animals, by Drs. Goentner, Ridge and others. Dr. Goentner reported a case of impotence in a well nourished "thoroughbred" stallion seven years old. Drs. Adams, Harger and others gave their views as to the medicinal and dietetic treatment indicated in such cases.

The president then appointed the following Committee on By-Laws and Constitution: Dr. Ridge, Dr. Adams and Dr. Williams. The essayists for the March meeting will be Dr. Adams on "Cataract in Domestic Animals and its Operative Treatment" (Demonstrated); Dr. Harger, "Median Neurectomy and the Anatomy of the Parts Involved in the Operation" (Demonstrated).

Dr. Schreiber, "Meat Inspection" (Continued).

Dr. Conrow, "Abortion in Dairy Cattle" (Continued).

Dr. Bartholomew, "Glanders & Mallein" (Continued).

Dr. Ridge volunteered to present a paper at the April meeting on "Traumatic Pericarditis," and Dr. Muir to commence a serial paper on "The Pharmacology of New Remedies."

Meeting adjourned at 11 o'clock. Twenty-nine present, including some visitors.

Attest, E. S. MUIR, *Secretary.*

The regular monthly meeting of the Philadelphia Society of Veterinary Medicine convened in the lecture room of the Department of Veterinary Medicine of the University of Pennsylvania, Wednesday evening, March 11, 1896, at 8.30 o'clock, with the president, Dr. M. E. Conard, in the chair, and an audience of thirty-five members and visitors. After calling the roll the minutes of February meeting was read and approved. Dr. Adams, as chairman of the Committee on Constitution and By-Laws, reported progress and stated that the committee would submit the result of their work, for action, at the April meeting. The following applications for membership were received, and on motion referred to the following Executive Committee for action thereon: Drs. Tag, Eves and Harger.

Applications—Dr. Warren T. Edwards, Downingtown, Pa.; Dr. D. B. Fitzpatrick, 1049 Belmont avenue, Philadelphia; Dr. Jas. Fairley, 1519 Carpenter street, Philadelphia; Dr. C. E. Magill, Haddonfield, N. J.

New Business—Dr. T. B. Rodgers moved to instruct the secretary to ask Dr. Eleanor Moore, of Woodbury, N. J., to deliver a lecture on "Hypnotism" at the April meeting of the society. Carried.

Dr. J. W. Adams read a paper on "Cataract in the Domesticated Animals and its Operative Treatment." In his remarks he spoke of the anatomy of the region of the eye, Etiology of cataracts, the different varieties, differential diagnosis, prognosis and the operative treatment.

Dr. Harger presented and read a paper on "Median Neurectomy for Lesions Below the Knee with the Surgical Anatomy of the Parts Involved." Considerable discussion arose as to the advantages of and objections to neurectomy in general, median, high plantar and low plantar. Drs. Rodgers, Harger, Adams, Fitzpatrick and others took part.

The president, Dr. Conard, then appointed the essayists for April meeting. Dr. Eleanor H. Moore on "Hypnotism;" Dr. W. H. Ridge on "Traumatic Pericarditis." The following members to report cases: Drs. Eves, Felton, Williams and Rodgers.

Meeting then adjourned at 11 p. m. to meet on April 8, at 8.30 p. m.

Attest, E. S. MUIR, *Secretary.*

Regular monthly meeting of the Philadelphia Society of Veterinary Medicine was held on Wednesday evening, April 8, 1896, at 8 o'clock, at the Department of Veterinary Medicine of the University of Pennsylvania, Dr. M. E. Conard, president, in the chair. Roll call showed sixty present, including some visitors. Dr. Harger moved to suspend regular order of business to hear paper on "Hypnotism," by Dr. Eleanor Moore. In introducing Dr. Moore, Dr. Conard remarked that it was probably the first time on record that a veterinary society had

been honored by having a lady essayist. Dr. Moore then read an interesting and instructive paper, which was enjoyed by all present, the subject being thoroughly considered by the essayist. After Dr. Moore had finished she was presented with a bunch of roses, by the president, in behalf of the society; they were received with a few well-chosen words.

Discussion.

Dr. Harger.—To what do you attribute the influence of some persons over wild animals?

Dr. Moore.—I do not know, Dr. Maule, of Berlin, says it is due to hypnotic influence.

Dr. Adams.—McGill University has a psychological society and is doing interesting work, although they do not go into the subject deeply.

Dr. Adams.—Wild animals are tamed (?) first by poking them, through the wires of the cage, with a red-hot iron; cowing the animal by burns and afterwards entering the cage and keeping up the "impression" by means of a painted stick.

Drs. Felton, Rodgers and Conard also took part in the discussion.

Dr. Conrow moved that a vote of thanks be extended to Dr. Moore. Carried unanimously. Returned to regular order of business. Reports of committees, Dr. Adams, as chairman of Committee on By-Laws and Constitution, reported progress, and stated that a draught would be ready at May meeting for action.

Applications for membership were received from Drs. Mecray, Underhill and Salinger, and referred to Executive Committee.

Dr. W. H. Ridge then read an interesting paper on "Traumatic Pericarditis," one case in particular revealing on post-mortem examination, a combined hardware store and hair dresser's establishment, there being a large quantity of nails, hairpins, etc., found in the stomach. Drs. Rodgers and Conrow had quite an animated discussion on the subject; the latter giving as his opinion that in cases of rapid heart-beat without elevation of temperature a positive diagnosis of Traumatic Pericarditis could be made.

Reports of Cases.

Dr. Eves reported an interesting case of Traumatic Pericarditis, also two cases of colic, which responded to barium chloride, after large doses of oil had failed to produce purgation.

Dr. Muir reported case of intestinal calculus, and presented a specimen found on post-mortem weighing 2400 grams.

Dr. Felton reported a case of prolapse of the bladder, in a spaniel dog, due to inflammation of prostate glands, the latter causing the animal to strain in attempting to urinate.

Dr. Williams read a paper on "The Action of Barium Chloride in Colic," in which he stated that this drug seemed to give negative results in the cases in which he had administered it. This paper brought out considerable discussion, the majority of the members present being favorable to the use of barium chloride in colic.

Dr. T. B. Rodgers reported three interesting cases.

There being no further business, the meeting adjourned to meet May 13, 1896.

Attest, E. S. Muir, *Secretary.*

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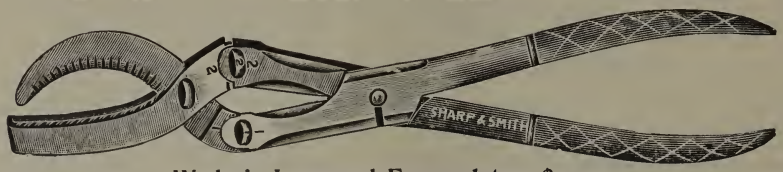

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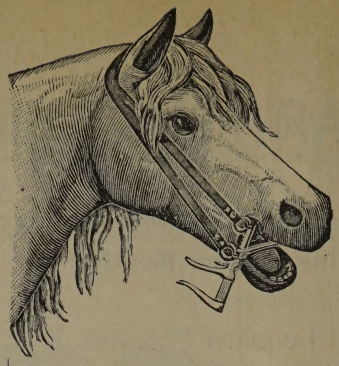

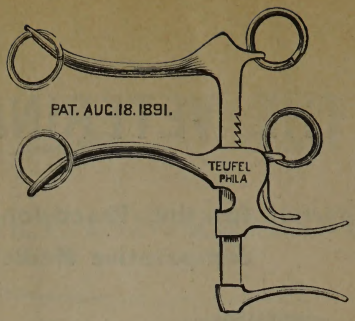

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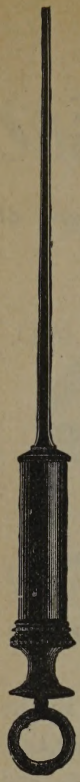

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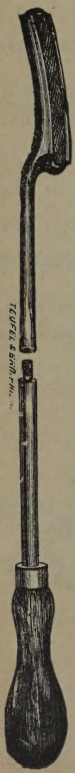

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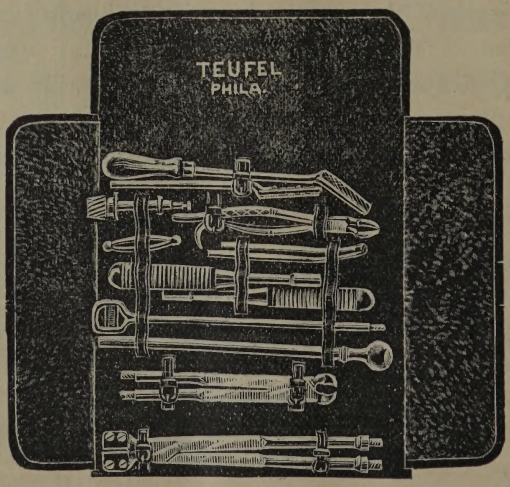

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